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A MONTHLY MAGAZINE

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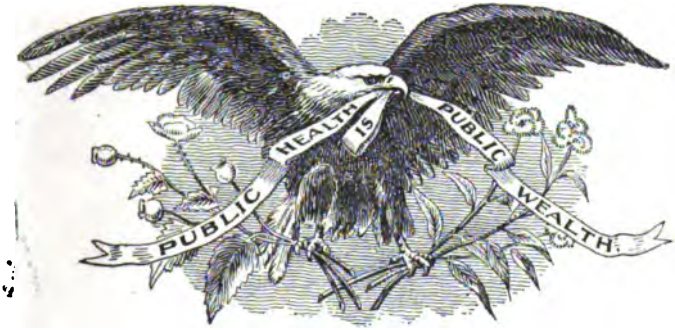

VOLUME XLIII., JULY TO DECEMBER.

A. N. BELL, A.M., M.D., Editor.

T. P. CORBALLY, A.M., M.D., HARRY KENT BELL, M.D., } Associate Editors.

NEW YORK: A. N. BELL.

1899.

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THE SANITARIAN.

JULY, 1899.

NUMBER 356.

SANITARY LESSONS OF THE WAR.*

By GEO. M. STERNBERG, M. D., L.L. D., Surgeon General U. S. Army.

ABSTRACT.

As compared with the Civil War and with other great wars during the present century the mortality from wounds and disease among our troops during the war with Spain has been low. Our wounded have, to a large extent, had the advantage of prompt treatment with antiseptic dressings, and a very considerable proportion of those who were not killed outright have recovered without any mutilating operation or septic complication. The mortality from disease has also been comparatively low, but, unfortunately, during the first months of the war that scourge of new levies of troops, typhoid fever, prevailed in many of our camps and claimed numerous victims. It is well known to sanitarians and military surgeons that as a general rule more soldiers succumb to disease than are killed by the bullets of the enemy, and our recent war has not been an exception in this regard. The total number of deaths reported in our enlarged army, including regulars and volunteers, from May 1, 1898, to April 30, 1899, is 6,406. Of these 5,438 died of disease and 963 were killed in battle or died of wounds, injuries or accident. During the Civil War the number of deaths from disease was 186,216. The number who were killed in battle or died of wounds was 93,969, or about one-half of the deaths from disease. The total deaths from disease in the Union armies from the commencement of the war to

*Read before the Section on State Medicine at the meeting of the American Medical Association, Columbus, O. June 8, 1899.

the 31st of December, 1862, was 34,326, and in the Confederate armies during the same period 31,238.

The following table gives the monthly death rates from disease in our armies from May 1, 1898, to April 30, 1899, and, for comparison, the rates for the same period during the first twelve months of the Civil War:

COMPARISON OF MONTHLY DEATH RATES (PER 1,000) FROM DISEASE.

	1861-1862.			1898-1899.		
Months.	Mean Strength.	No. of Deaths.	Ratio per 1000 of M. S.	Ratio per 1000 of M. S.	No. of Deaths.	Mean Strength.
May.	16,161	18	1.11	.26	42	163,726
June.	66,950	55	.82	.44	90	202,526
July.	71,125	106	1.49	1.72	451	262,613
August.	112,359	242	2.15	5.21	1,400	268,507
September. ..	165,126	365	2.21	5.89	1,541	261,824
October.	256,884	725	2.82	3.17	809	255,000
November. ..	301,848	1,145	3.79	1.51	365	242,000
December. ..	343,184	1,471	4.29	.84	201	240,000
January.	352,760	1,598	4.52	.85	180	211,000
February.	327,734	1,346	4.11	.87	156	180,000
March.	328,878	1,575	4.79	.90	123	136,000
April.	410,416	1,881	4.58	.71	80	113,000
Annual.	229,452	10,522	45.86	25.73	5,438	211,350

In addition to this 24,184 deaths are recorded as from unknown causes, and probably most of these deaths were from disease.

In comparing the death rates from disease during the year of the Spanish-American War, May 1, 1898, to April 30, 1899, and the first year of the Civil War, May 1, 1861, to April 30, 1862, note should be taken in the first place that the mean strength in May, 1861, was only 16,161, as compared with 163,726 men in service in May, 1898. The mustering in of volunteer troops progressed more slowly in 1861 than during the recent war, so that it was not until September and October, 1861, that the mean strength assumed proportions equal to that of the months of the Spanish War. Although the number present in the camps of 1861-62 after October, 1861, was largely in excess of those aggregated during the past year, the average annual strength during both wars did not differ greatly. Nevertheless the deaths from disease

in 1861-62 numbered 10,522, while in 1898-99 they amounted only to 5,438. The death rate per thousand of strength mounted gradually month by month in 1861-62, and, indeed, it did not reach its acme until February, 1863, when the rate of 6.39 was reached. In 1898, on the other hand, the acme, 5.89, was reached suddenly in September, but owing to the sanitary measures adopted the fall during October and November was as rapid as had been the rise.

The same gradual rise is seen in the mortality statistics of typhoid fever during the Civil War. The highest death rate, 2.81, was not reached until May, 1862, the thirteenth month of the aggregation of the troops, when 1,092 men died of this disease, and the fall of the rates was as gradual as the rise. On the other hand, the rise in 1898 was sudden, the maximum rate, 3.57, being reached in September, when 933 men died of this disease; but the fall during the months of October and November was as notable as the rise. This sudden suppression of the disease cannot be attributed to an exhaustion of the susceptibility of the troops to attack from this fever, as they only suffered at the rate of 12.37 per thousand of strength during the twelve months, whereas the troops of the Civil War suffered at the rate of 19.71 per thousand. It can be attributed only to the active preventive measures that were instituted, and especially to moving the troops to fresh camp sites and to the greater care exercised in the disposal of excreta.

The average mortality from typhoid fever in our regular army since the Civil War has been: for the first decade (1868-1877), 95 per 100,000 of mean strength (.95 per 1,000); for the second decade (1878-1887), 108 per 100,000; for the third decade (1888-1897), 55 per 100,000. This latter rate compares favorably with that of many of our principal cities. For example, it is exceeded by the typhoid death rate in the city of Washington, which is 78.1 per 100,000 (average of ten years—1888-1897); by that of the city of Chicago, which is 64.4 per 100,000; by that of Pittsburg, which is 88 per 100,000. These figures, however, do not show the entire mortality in the cities mentioned as a result of typhoid fever, for without doubt many of the deaths ascribed to "malarial fevers" were in fact due to typhoid infection. Thus in the city of Washington the deaths reported from typhoid and typho-malarial fever (average of ten years) numbered 78.1 per 100,000 of the population, while 23.4 per 100,000 are recorded as due to malarial fever. In Baltimore the mortality, as recorded, from typhoid fever is 41.5, and from "typho-malarial and other malarial fevers" 18.3 per 100,000. In St. Louis the figures are: typhoid

fever 35.7, typho-malarial and other malarial fevers .49 per 100,000; in New Orleans, typhoid fever 26.1, typho-malarial and other malarial fevers 107.2 per 100,000.

It will be seen that sanitary conditions at our military posts in time of peace, as judged by the typhoid death rate, compare favorably with those in our large cities in various parts of the country. As a matter of fact great attention has been given to post sanitation for many years past, and through the persistent efforts of officers of the Medical Department great improvements have been made, especially during the past ten years. The result is shown in a reduction of the typhoid mortality from 108 per 100,000 in the ten years ending in 1887 to 55 per 100,000 in the decade ending in 1897. Hygiene is made one of the principal subjects of examination for candidates desiring appointment in the Medical Corps of the Army, and at subsequent examinations for promotion to the grade of captain and major is given a most prominent place. It is also the most prominent subject in the course of instruction at the Army Medical School, where the student-officers spend five hours daily for a period of five months in practical laboratory work relating for the most part to the cause and prevention of infectious diseases. It should be remembered, however, that the Army Medical School was not established until the year 1893, and consequently but a small proportion of the medical officers of the army have had the advantage of this course of instruction.

But the comparatively small number of medical officers of the regular army available for duty in the large camps occupied by our volunteer troops at the outset of the war proved to be entirely inadequate to control the sanitary situation in these camps, and as a result of the conditions existing the mortality from typhoid fever in our armies during the year ending April 30, 1899, has been more than twenty-two times as great as it was in our regular army during the decade immediately preceding the war period. As compared with the first year of the Civil War, however, there is a decided improvement, the typhoid mortality for the first year of the Civil War having been 1,971 per 100,000 of mean strength, and for the Spanish-American War 1,237 per 100,000. Moreover, the vigorous sanitary measures enforced enabled our troops to quickly free themselves from the ravages of this infectious disease, and while the line of typhoid mortality continued to ascend during the first year of the Civil War and subsequently, it rapidly fell after the middle of September, last, and for the last six months of

the period under consideration has been remarkably low. Indeed, in the history of large armies the record has never heretofore been equalled.

Typhoid fever in our camps has been to a large extent due to the neglect of well-known sanitary measures indicated by me in Circular No. 1, dated, Surgeon General's office, Washington, April 25, 1898; also to a very general failure upon the part of medical officers attached to regiments to recognize the disease in its milder forms and during its earlier stages. As a result of this the camps became infected, and the failure to use proper methods of disinfection, and the continued occupation of infected camps, has led to the development of veritable epidemics of typhoid fever in several of the camps occupied by our troops.

The principal lessons to be derived from our recent experience may be stated as follows:

A trained medical corps, hardly adequate for an army of 25,000 men, cannot control the sanitary situation when this army is quickly expanded to 250,000. Physicians and surgeons from civil life, however well qualified professionally, as a rule are not prepared to assume the responsibilities of medical officers charged with administrative duties and the sanitary supervision of camps. The proper performance of such duties cannot be expected from a physician without military training or experience, no matter how distinguished a position he may have held in civil life.

Courage and patriotism on the part of line officers and enlisted men cannot take the place of knowledge and experience. New levies of troops are as a rule ignorant of the first principles of camp sanitation and reckless as to the consequences of their neglect of prescribed sanitary regulations. Therefore training and discipline are essential factors in the preservation of the health of soldiers in garrison or in the field.

The value of the aphorism "in time of peace prepare for war" has received additional support. This preparation should include a corps of trained medical officers larger than is absolutely necessary for the army on a peace basis, and systematic instruction in military medicine and hygiene for the medical officers of the National Guard as well as for those of the Regular Army; also instruction of line officers in the elements of hygiene, and especially in camp sanitation. It should also include the establishment of camping grounds in various parts of the country, having an ample supply of pure water, a proper system of sewers, etc. If our volunteers could have been assembled in such camps during the late

war a saving in lives and money would have resulted which would without doubt have demonstrated the economy of such preparation for war in time of peace.

CLEANING OF SANTIAGO.

MAJOR BARBOUR TELLS HOW THAT PEST-HOLE WAS CLEANSED.

From the New York "Sun," May 14, 1899.

Washington, May 13.—Major George M. Barbour, the Sanitary Commissioner for the city of Santiago, Cuba, in a private letter to a friend in this city, gives an interesting account of the manner in which the Americans have cleaned out that pest-hole and made it possible for an American, a Cuban, or a Spaniard to live in Santiago without danger of incurring yellow fever. Major Barbour writes:

"This is now as clean and as healthy as any city in the world, the result of American ideas, of constant attention, unremitting energy and a good heavy Spanish riding whip frequently used. As yet there is no established defined law on this or any other specific matter, simply a sharp military order, on my request, and then, backed by such order, I go ahead and execute the work and cause obedience by polite request or by force, as the case and the person make expedient. No '$5 fine and costs or ten days' here as yet. After an inspection and a second order, if that is found necessary, all goes well, if that second order is obeyed. If not, more drastic measures.

"The population of Santiago is now very accurately known to be about 73,000 people, of which about 60 per cent. are extremely ignorant, careless, superstitious and—filthy. On July 28, 1898, the population, consisting of American troops, American civilians, Red Cross employees (clerks, nurses, etc.), Spanish troops, Spanish civilians, not real residents, reconcentrados from the outlying districts, and native residents of the permanent kind, was 136,000. That day we had 216 deaths and the Sanitary Board burned over 100 corpses and buried the others. As an indication of the changed

conditions I cite from the official records the number of deaths which have occurred on the 12th day of April for each of the past six years: In 1893 there were 11 deaths; in 1894, 17, and in 1896, 9. These three periods were during peace times. In 1897, the war period, there were 32 deaths. On the same day in 1898 there were 41, but on April 12 of this year, under American control, not a single death. This result has been accomplished by simply cleaning up the vast accumulations of filth of nearly 400 years, for it is recognized that all epidemics among human kind originate only in human filth, ignorance and negligence. Last month we had nine days with but one death. At present we are employing about thirty-five teams, and remove an average of 200 loads daily, consisting of 4,500 packages, barrels, boxes, cans, bags, etc., from the houses. We have two carts constantly scattering, liberally, disinfectants in the streets, gutters, areas and other places where accumulations are likely to occur. In those red-hot days in July last the Sanitary Commission was composed largely of American soldiers. To-day only the interpreter, the wagonmaster and myself, three in all, are from the United States.

"There has been much said about the native Cubans to their discredit. The most of this is very true. That they are indolent, as all Spanish-Americans are, stupid, given to lying and doing all things in the wrong way from the more practical American standpoint, is not to be disputed, and yet I find them docile, willing and careful, as much so in all these qualities as any class of labor in the world. Emphasis, profanity and gesticulations are wasted upon these people, because they become easily frightened, nervous and excited, and do everything the wrong way. I found that in addressing them simply and briefly I accomplished far more than any loud talk or threatening manner could.

"All the men of the sanitary corps are uniformed and render military salute and obedience. The city has been divided into districts, with an excellent foreman for each. These foremen are men of good standing and education, a sort that their fellow natives, the laborers, respect. These foremen have absolute control over the selection, employment and dismissal of their subordinates. In dealing with the men we deal directly with the foremen, give them their orders and hold them absolutely responsible for the performance of the work desired to be done. After vigorous and energetic action on the part of the authorities the throwing of slops, offal and debris into the streets, which is a common practice among all Spanish-American peoples, has been reduced to the

minimum. It was found necessary at the beginning to use the whip to enforce ordinary decency among some of the people here, but they are rapidly becoming used to American ways and to the American disgust of the filthy habits formerly universally practiced.

"One of the great curses of this city last year was the enormous number of dogs to be found on the streets. We killed about 6,000 of these animals up to Jan. 1. They are getting rather plentiful again, I notice, and it is the intention of the department to begin slaughtering them once more at a near day. The killing of all animals—horses, mules, dogs, etc.—is done by this department. Our elimination of the microbic danger here is the most effective in the world—fire. The great garbage dumps are heavily sprinkled with the cheapest crude petroleum, which burns slowly, and burned.

"Within twenty-four hours after the American troops entered Santiago last July the Sanitary Commission was ordered. I was sent for, consulted, and appointed, and told 'to clean this city, and if two Americans die of yellow fever you will be hanged.' This, of course, was in a joking spirit, but I have attempted to so cleanse the town that yellow fever will no longer find lodgment here. On the morning of July 21, 1898, the work was begun. There was a stupid, ignorant mob of wildly excited but eager specimens of humanity, 600 strong, to start with. The filth and debris of bombarded buildings, ramshackle dwellings and stores was awful. I secured a Spanish horse, ate plenty of bread with black coffee, drank plenty of good American whiskey, got a whip, and sailed in. We broke into the houses and every where else where the smell indicated a corpse, human or animal, and removed 1,161 dead men and 250 animals in 68 days, beginning and including July 21, and the weather was, to me, red hot.

"I dropped all theoretical advice about one's health; took no special precautions or care of myself; kept in good humor, left water entirely alone, drank plenty of black coffee, claret and constant nips of whiskey. With a relay of horses I was in the saddle from 5:30 in the morning until 6 or 7 in the evening, and just pushed things for all I was worth. In many cases the men were encouraged by the example which the Americans set to the gangs of timid, suspicious and superstitious laborers. It frequently happened that I was compelled to force my way into houses and other places wherein was a smell of a black, swollen body, a victim of the yellow fever. I would grab this, roll it into a blanket, quilt,

sheet or anything else that was handy, throw it into a wagon, and with a load of eight or ten others, hurry to the dumping place, and with fire and petroleum soon send them to ashes and to heaven.

"I cannot speak too highly of the magnificent work, energy and thoughtfulness of Gen. Leonard Wood, the Governor. As to the future of this sanitary effort it is difficult to predict the outcome. All the natives declare it is wonderful, and are ecstatic in their praise of the work that has been accomplished. They evidently admire it, and no doubt appreciate the happy results. The children are all intensely friendly to us Americans, and I believe the women are also, and they earnestly wish us to remain in Cuba, as do the real Spaniards and all men of property. Under our supervision and with firm and honest care for the future, the people of Cuba may become a useful race and a credit to the world, but to attempt to set these people afloat as a nation during this generation would be a great mistake. We must wait until the children of to-day are old enough to think for themselves and to absorb American ideas, which they are rapidly doing. To create a Cuban republic to-day and leave it without assistance from this or some other equally powerful government would result in deadly loss of life and property and in chaos all over the island. It would simply be to abandon to the worst elements the men of means, energy and intelligence.

"The foremen of this department inform me that if the Americans should withdraw to-day the sanitary corps of Santiago would instantly become a political wagon for the 'ins' and the jealous envy of the 'outs.' Already there are two factions here, and their personal bitterness is quite astonishing to the Americans. I have stated that certain classes of this people are patient, docile and willing, but I recall that history teaches that such kind are always the most easily led and swayed into acts of lawlessness, and that under certain conditions they easily become most destructive, unreasoning, murderous and revengeful. I doubt if the sanitary department would exist for one year for the purposes for which it was formed if the Americans should be withdrawn to-day, but as an unwieldy, useless machine for political jobbery it would long exist."

PROPER TROPICAL DIET.

On the recent departure of Major LOUIS L. SEAMAN, who was surgeon of the First Regiment, U. S. Volunteer Engineers, and accompanied that regiment through the campaign in Porto Rico, the New York Tribune of May 21 invites attention to the paper read by Major Seaman at the New York Academy of Medicine, in February, on "The United States Army Ration and Its Adaptability for Use in Tropical Climates."

In that paper Major Seaman pointed out how unfit for the tropics was the ration ordered by the military authorities, and suggested changes which in the opinion of those qualified to pass upon the matter would prove measurably effectual against a recurrence of the diseases and physical disabilities to which the defective ration contributed among the troops in the recent hostilities in Cuba and Porto Rico.

We are gratified to learn that Major Seaman intends to continue his researches on the subject of an appropriate tropical ration during his service in the Philippines. It is understood that the result of his investigations will be embodied in a report which he has been requested to make to the War Department on his return.

Since it will be necessary for the United States to garrison its new tropical possessions, it is recognized by the War Department that an improved dietary for the men who will be called upon to serve in those regions is of the utmost importance.

The evidence brought out in the recent investigations made it clear that some change is imperative in the food of soldiers detailed for duty in tropical climes. Apart from this evidence, however, Major Seaman's paper before the Academy of Medicine was sufficiently convincing as to this need. Alluding to the report of the Adjutant-General of the Army, which showed that the number of killed and those who died from wounds, in the few brief weeks of actual hostilities, was 345, while the mortality from disease was 2,485, Major Seaman remarked:

"Had these proportions been reversed the figures would have been nearer those to be expected in an age so advanced in sanitary science and dietetics. For the time from the landing of the army at Siboney and the fight at San Juan Hill to the signing of the proctocols, a period of less than seven weeks, was an interval

too short for disease, other than that of an epidemic or preventable character, to develop into serious proportions, especially when the class of men exposed were those selected for the special service. It is true the conditions encountered were somewhat formidable, the season of invasion being the worst that could have possibly been selected, the heat and moisture of the summer months combining to produce that extreme relaxation of the system which was a factor in the production of the many forms of tropical diarrhœa among the troops. But we must look beyond climate for the full responsibility.

"From earliest times history has shown that there has always been a greater mortality from disease among armies during a war than from wounds, especially in tropical countries, and Spain, keen in her appreciation of this fact, and knowing also that she had to fight, courted a summer encounter, convinced that the enemy which would devastate our ranks was in disease rather than the guns of her morros. In this she was right, but the aid received by the Spanish from the source mentioned was much greater than it would have been had our troops been appropriately fed. Duncan, the highest recognized authority in military hygiene, states in reference to campaigns in the tropics that, 'although there is an undoubted distribution of disease, yet it is important to remember that, so far from being unable to cope with it, we can act in antagonism to it. Take the class of bowel complaints; by insuring wholesome food, solid and liquid, we can remove all causes of irritation from within; by insuring a rational dress we can remove all irritation from without. Again, in the matter of conservancy, by insuring the absence of putrefaction from the camp, and the burning or disinfection of the excreta, we cut the ground away from the feet of cholera, enteric fever, yellow fever and bowel complaints.'"

Pointing to the wide ranges of temperature in this country, where in Alaska it dropped as low as 50 degrees below zero, and in Manila and Havana it hovered around the 100-degree mark, making an extreme variation of more than one hundred and fifty degrees, he drew attention to the fact that "the Government, liberal in all things, freely issues these supplies, but, strange to say, while making certain distinctions in the uniform of the soldier who must endure the rigors of Northern winters and the soldier on Southern or tropical service, there has never apparently been any official consideration given to the diets which the climates of such radical difference require. The same ration serves in all sections, and

while it is generous in quantity and usually excellent in quality, it is not such a one as can be universally used in hot and cold climates alike, if due regard is to be paid to the health of the soldier. Rich in nitrogenous, heat-producing elements, it is better adapted for the bodily needs of the soldier stationed in the North; but in extreme Southern latitudes and in the tropics it proves an active agent of disease, overheating the system and producing those conditions predisposing to fevers, intestinal and rheumatic diseases and rendering the labors of the surgeon unavailing."

In the dietetic changes which Major Seaman suggested for feeding the Army under tropical or semi-tropical conditions, he recommended that "the beef component and the salt pork should be reduced one-half, farinaceous food and fish being substituted therefor. Salted rations should be issued but once, or, at the most, twice during the week. Fresh meat should be provided from animals slaughtered at the point where issued. At points where native cattle in good condition cannot be procured, cattle from Texas can be as easily transported by the Government of the United States as by the merchants who now supply the Cuban markets from Texas and Mexico. Of the cereals, one of the best is hominy. The hulls of the maize being removed in the course of its manufacture, this source of irritation is avoided, while the grains, when softened by a thorough cooking, are nutritious, easily digested, and relished by the men. Equally valuable is the ration of rice now issued, and which should be quadrupled in quantity.

"The white bean of this country," he continued, "should not be issued for use in the tropics, for the reasons previously stated. In its place should be used the black or red native bean (frijol), which, while resembling the common bean in shape, is different in its properties. The hull is much thinner, and when thoroughly cooked does not irritate, while the pulp is drier, breaks up readily with cooking and is easily acted on by the digestive fluids, and does not produce irritation. This bean, together with the tortilla, practically made from hominy, forms almost the entire diet of the Mexican army, and there are few if any soldiers who can endure greater fatigue or make longer marches, or among whom is less sickness from dietary causes. In addition to the above, dried fruits, especially apples and prunes, should be added to the ration. Their effect when used in Porto Rico was invariably observed to be beneficial."

AMERICAN CLIMATOLOGICAL ASSOCIATION.

SIXTEENTH ANNUAL MEETING, HELD IN NEW YORK CITY, MAY 9, 10, AND 11, 1899.

BEVERLEY ROBINSON, M. D., OF NEW YORK, PRESIDENT.

Abstract of the Proceedings.*

First Day—Tuesday, May 9th.

The meeting was called to order at 10:30 A. M. by the president, Dr. Beverley Robinson, of New York, in the hall of the Academy of Medicine.

OPENING ADDRESS.—The president, in his opening address, declared his belief that, in the near future, the physician would become more than ever before the counsel and guide in all matters affecting the public health. He dwelt long and earnestly upon the ideal character of the physician, and exhorted his hearers to uphold steadfastly this idea, and do their utmost, both individually and collectively, to elevate the social and scientific plane of their chosen and honored profession. The speaker asserted that, without intruding at all upon the domain of theology, the physician could and should administer to the soul as well as the body, and should ever strive to keep himself in close touch and sympathy with his patients. Regarding modern medical science, he thought that the rôle played by microbes in disease had often been misinterpreted. In many instances it was probable that even the destruction of the microbes found to be present would not stamp out the disease itself. Laboratory research should be fostered, but the most important work of the clinician should not be ignored.

TREATMENT OF CONSUMPTION BY AIR AND LIGHT IN COLORADO.—Dr. Charles Fox Gardiner, of Colorado Springs, read a paper with this title.

Air as a Cure.—He said that air was the first requisite in the cure. Air and light differed widely in their character and purity in various localities. The air should be pure; it should be dry and

* From the Medical Record.

thin in order to increase chest expansion; it should be cool in order to act as a stimulant, and it should contain a considerable proportion of ozone. These properties were to be found in the air of Colorado. The chemical intensity of the light in that State, as compared with that in the East, could be strikingly demonstrated by exposing a photographic plate, under as nearly as possible identical conditions, in the two localities. He had made a severe test of the climate of Colorado on several patients, during that part of the year when the weather was most inclement, *i. e.*, from September to April. The result was presented on a colored chart, thus indicating at a glance the character of the weather and the number of days suitable for out-door life.

Ranching.—He had practised medicine for several years on a ranch, and knew something of such life. He had become convinced that it was all that a well man could do to eat and digest the food furnished in such places; moreover, the life was too rough, and there was too much exertion for the average pulmonary invalid.

Tent Life.—He favored life in a tent, the latter to be eighteen feet high, sixteen feet in diameter at the base, and having a five-foot wall. The average tent became very foul when closed up, and hence special precautions should be taken so to construct the tent as to secure proper ventilation. As far as possible, persons suffering from consumption should live out-doors all of the twenty-four hours.

Dr. W. L. R. Phillips, of the weather bureau, Washington, D. C., said that he thought the value of light in the treatment of consumption had not received its share of attention. While it was true that pulmonary patients had recovered in high altitudes, he felt that they had done so under great disadvantages, and that the cure was to be largely attributed to the light in such localities. In his opinion, there had been experiments made showing that light increased the hæmoglobin in the blood and very materially improved the general health of consumptives.

Dr. E. O. Otis, of Boston, asked what was the average number of hours that Dr. Gardiner had been able to keep his patients in the light and out on the piazza.

Dr. Gardiner replied that the average case in Colorado could be kept out five and a half hours a day all through the winter, and this length of time could be materially extended if the patient could be properly controlled.

Dr. N. S. Davis, Jr., of Chicago, said that he was convinced

that climate had much to do with the promptness and efficacy of the out-door treatment of tuberculous cases. During the last few years the pendulum of opinion had been swinging toward the view that tuberculous patients could be treated in all sorts of climates, provided they could be kept out-doors continuously. It was true that certain patients suffering from tuberculous disease had been cured in widely differing climates, but it was equally true that in certain climates the chances of effecting a cure were much greater than in others. He believed personally that a climate like that of Colorado was especially suitable for the treatment of these cases.

Dr. Samuel A. Fisk, of Denver, expressed his firm belief in the value of climatic treatment, but warned against under estimating the rôle played by nutrition.

SUGGESTIONS CONCERNING EARLY DIAGNOSIS IN PULMONARY TUBERCULOSIS.—Dr. Sherman G. Bonney, of Denver, read this paper. He said that he had not infrequently failed, for a considerable time, to find the tubercle bacilli in the sputum, although the symptoms and physical signs pointed clearly to the existence of pulmonary tuberculosis. Of 546 cases seen in his private practice, 388 had arrived in Colorado with distinct evidence of tuberculosis in both lungs. In 36 cases an interval of less than three months had elapsed from the making of the diagnosis to their arrival in Colorado; in 20 cases the interval had been between nine and twelve months; in 83 cases it had been between twelve and eighteen months; in 225 cases the interval had been over eighteen months. Thus, the average delay in the 546 cases had been a little over eighteen months. Since compiling these statistics he had learned of a paper, written some years ago by Dr. S. E. Solly, in which the average period of delay in one hundred cases had been two years. Dr. Bonney said that in 105 of his own cases there had been well-defined cavities present. Nearly 50 per cent. had given a family history of strong susceptibility to tuberculosis. In 129 cases there had been a distinct onset of a definite bronchitic character; in 159 cases there had been a gradual anæmic onset; in 114 there had been a sudden hemorrhage as the first symptom, and the average period elapsing before their arrival in Colorado had been two years and three months. In 61 cases there had been a distinct idiopathic pleurisy preceding the pulmonary process, occurring as an initial manifestation or subsequently. The average interval between the attack of pleurisy and the arrival in Colorado had been three years. There had been a much shorter average

period in cases beginning with a distinct bronchitis, or with influenza, than in the others, particularly those beginning with hemorrhage, and this fact should teach an important lesson to the general practitioner. A pulmonary hemorrhage, of undetermined nature, should be looked upon as fair evidence of the existence of a localized tuberculous process, and this evidence assumed still greater importance when occurring suddenly in the course of other diseases. By the systematic use of the clinical thermometer, at intervals of several hours, one might often clear up a doubtful case. It was a fact that thorough physical exploration of the chest was rarely made until, from the rational symptoms, a provisional diagnosis of pulmonary tuberculosis had been made. If the examination was not made on the bare skin, the conclusions would be untrustworthy. A common error was to neglect to explore the whole chest. The patient should be made to cough just before inspiration, as this was an exceedingly valuable means of eliciting moist crepitation in the bronchial tubes.

Dr. Fred. I. Knight, of Boston, said, with regard to the presence of bacilli in the earlier stages, that he had very rarely failed to find bacilli in the sputum of his patients. It was true that these patients had usually had cough, whereas those developing pulmonary tuberculosis without cough usually came first into the hands of the general practitioner. The delay observed in hemorrhagic cases in seeking climatic change was interesting as apparently confirming the view that these cases ran a slower course than the others.

Early Diagnosis by the Laryngoscopic Picture.—Dr. John O. Roe, of Rochester, said that he regarded the laryngoscopic examination as exceedingly important in making the early diagnosis of pulmonary tuberculosis. In this way the diagnosis could be made not infrequently before the bacilli could be demonstrated in the sputum, or physical changes could be detected in the lungs. The peculiar anæmic condition of the larynx and the general appearance of the mucous membrane gave a very early hint as to the probable existence of tuberculosis of the lungs.

Dr. R. H. Babcock, of Chicago, said that he had been impressed with the very large percentage (seventy-one per cent.) of Dr. Bonney's cases that had been kept at home for treatment until the later stages. It was probably true that in many of them the delay had been caused, as the reader of the paper had said, by the neglect to make an early diagnosis; but he could not help believing that not uncommonly this delay was really due to the re-

luctance of the physician to lose sight of his patient. It seemed to him impossible for any physician, no matter how ignorant of physical diagnosis, to retain such patients for eighteen months or more without recognizing the true condition. It was his custom invariably to recommend these persons to seek a favorable climate as a first step, and to insist upon the advantages of doing so. If due attention were given to even slight changes of temperature for a period of a week or more, he felt sure that the study of the rational symptoms would lead to a correct and early diagnosis. He was skeptical about a laryngological examination detecting tuberculosis before it could be recognized in the chest, for he had frequently called upon medical friends, who were expert laryngologists, and had not derived from them such assistance.

Dr. R. G. Curtin, of Philadelphia, said that the delay in sending many patients away was often due to a lack of money or to reluctance to leave home.

Dr. Richard C. Newton, of Montclair, said that, in his experience, tuberculosis of the larynx was comparatively infrequent, and hence he, too, was skeptical as to making an early diagnosis from the appearance of the larynx.

Dr. E. Fletcher Ingals, of Chicago, said that there was something peculiar in the almost atrophied condition of the larynx which would lead the laryngologist to suspect pulmonary tuberculosis. If he saw this condition of the larnyx, he would not feel justified in reporting such a case as one of tuberculosis, yet it would afford good grounds for suspecting the existence of consumption. This probably explained why Dr. Babcock's laryngological friends had not helped him in the diagnosis.

Dr. Roe remarked that the laryngologist must distinguish sharply between tuberculous laryngitis and the peculiar state of the larynx very commonly observed in phthisical patients.

Dr. C. F. McGahan, of Aiken, S. C., confirmed this statement.

Dr. Otis said that the importance of susceptibility to tuberculosis had been emphasized, but he would like to call attention to the question of exposure to tuberculosis, and also to two factors brought forward by the French school—viz., (1) the vital capacity and (2) lowered arterial tension.

Dr. Phillips said that he had observed very commonly a subnormal temperature in tuberculous patients; it seemed to him almost as common as elevation of temperature.

Dr. Knight said that all laryngologists agreed that there was

a certain appearance of the larynx which led to the suspicion of tuberculosis of the lungs, but it had been described too vaguely.

Dr. Roe, in reply, said that the larnyx in these cases would be so atrophied as to make the muscles and vessels stand out with unusual prominence. In addition, there was a striking pallor of the larynx, notably about the epiglottis.

Dr. S. W. Langmaid, of Boston, said that this appearance of the larynx was a sign of anæmia rather than of tuberculosis, but there were a paresis and a changed condition of the glottis which showed that the nerve force had been greatly diminished, and that seemed to him much more indicative of tuberculosis.

Notes on the Tuberculin Test.—Dr. E. O. Otis, of Boston, read a paper with this title. He said that he had injected some cases of undoubted tubercolosis which had not exhibited the characteristic reaction, and, on the other hand, had obtained a distinct reaction in cases in which there had been nothing else to indicate tuberculosis. His experience with this test comprised one hundred and eleven cases, which had been tested originally with the idea of determining how many cases of cervical adenitis were tuberculous. Out of fifty-six cases of this kind, thirty-three had given a distinct reaction, six a slight one, and two a doubtful reaction. It was true that a certain proportion of cases of syphilis would react to the tuberculin test, but this, in practice, did not seriously impair the diagnostic value of the test in tuberculosis. In none of his cases had there been any serious result from the application of this test, although in a number of instances the reaction had been quite severe.

The Reaction.—If a patient experienced sensations of weakness, of heat and cold, and with these there were anorexia, pain in the limbs, severe headache, sweating, and a rapid and feeble pulse, it was considered that a reaction had occurred, irrespective of the range of temperature.

Dosage.—He had injected the tuberculin in the arm and preferred Koch's preparation because of its concentration. The injection should be made deep into the muscles. The majority of observers favored the use of doses of from ½ to 10 mgm. He had never used over 12 mgm. of Koch's tuberculin, and usually from 5 to 10 mgm. for an adult, and ½ to 3 mgm. for children. In non-tuberculous patients the reaction would sometimes be obtained if the maximum dose, just given. was exceeded.

Dr. Langmaid said that in the early days of the tuberculin test, a number of his patients at the Massachusetts General Hospital

had, without his knowledge, been subjected to the test. He had been astounded at the remarkable appearance presented by the larynx, and this had led him to ask for an explanation. He had then learned that one of the internes had been induced to abstract a few of the speaker's patients for the purposes of this test. He mentioned this fact because of the impartial and spontaneous testimony regarding the action of the tuberculin on the larynx. He would like to know what Dr. Otis thought would be the outcome of his cases of cervical adentitis in which the tuberculin reaction had been obtained.

Dr. Otis replied that he had made these observations because it seemed to be an unexplored field. He thought it had been proved that a fair proportion of cases of adenitis subsequently developed tuberculosis.

Dr. Otis, in closing, said that in the few cases in which he had used this test in private practice the patients had made no objection to it.

SUBSEQUENT HISTORIES OF "ARRESTED CURES" OF PHTHISIS TREATED AT THE SHARON SANATORIUM.—Dr. Vincent Y. Bowditch, of Boston, read a paper with this title, based on his experience at this sanatorium, whch is situated not far from the sea and without special reference to altitude. The statistics since the opening of the sanatorium in 1891 were reviewed. Excluding two recent cases, there remained thirty-four cases, of which six had died, twenty-four were now alive and well, and four had had a slight return of symptoms, but were outwardly well. One patient had been away for seven years, and had had no recurrence. An effort was always made to secure for the discharged patients conditions of life entirely different from those under which the disease had been originally contracted. The chief features in the treatment at the sanatorium were the insistence upon fresh air, judicious exercise, and wholesome food, medicine being used quite sparingly as adjuvants.

Dr. J. E. Stubbert thought too much stress should not be placed upon the presence of tubercle bacilli as positive proof of the existence of pulmonary tuberculosis; he had very often been unable to find them in incipient cases, and had known the bacilli to be absent for five weeks at a time in cases presenting unequivocal signs of consumption. In a case of this kind, three different observers had failed to find bacilli during this rather long period.

Dr. Edward R. Baldwin, of Saranac Lake, said that at the Adi-

rondack Sanatorium they were in constant correspondence with one hundred and fifteen patients who had been discharged in the last ten or twelve years; and while a few had relapsed slightly, the majority of them were well and at their homes.

ROENTGEN-RAY EXAMINATIONS IN INCIPIENT PULMONARY TUBERCULOSIS.—Dr. Francis H. Williams, of Boston, read this paper. He said that in forty-five adults examined with the X-rays, he had ascertained that the average excursion of the diaphragm on the left side was two and one-half inches, and on the right side about one and one-half inches more. He had been impressed with the association of rheumatism and tuberculosis. In five cases the X-ray examination had given notice of change in the lungs before the physical signs. If the area of increased density was much below the surface of the lung, as, for instance, in a central pneumonia, its presence would not be recognized by auscultation and percussion, but its shadow would be seen on the X-ray screen as surely as though this area were more superficial. By careful experimentation he had demonstrated that a lung the seat of pneumonia or tuberculosis offered ten times more resistance to the X-rays than did a healthy lung. The diagnosis of tuberculosis was not made by the X-rays alone, but, in some instances, it had certainly given early notice of a departure of the lung from the normal, and this information, taken in connection with the history and rational symptoms, afforded a valuable basis for an early diagnosis. In cases of pulmonary tuberculosis the X-rays showed the apex of the lung darkened and the excursion of the diaphragm shortened. He had made more than two thousand examinations of the thorax with the X-rays, and had never seen any injury result therefrom.

Dr. Frederick I. Knight, of Boston, said that, in his experience, many months often elapsed after evidence of the initial catarrh of a tuberculosis before it was possible distinctly to recognize pathological changes in the lungs by the alteration of the percussion note.

Dr. J. E. Stubbert said that the fluoroscopic screen was far more accurate and convenient than the fluoroscope. He had yet to see an incipient case of tuberculosis that could not be accurately diagnosticated by the X-rays. Examination with the X-rays was especially useful in cases in which tuberculosis foci were scattered throughout the lungs—a class of cases in which the physical signs were apt to be equivocal.

Dr. Williams, in closing, said that the illustrative cases that he

had reported had been, for the most part, those in which consolidation had been demonstrated by the X-rays, although not even moist râles could be heard on auscultation. Emphysema could be recognized easily and certainly with the aid of the X-rays.

INTERMEDIATE ALTITUDE FOR THE CONSUMPTIVE.—Dr. B. P. Anderson, of Colorado Springs, read a paper on this subject, in which he gave his experience with patients whom he had sent from his locality to spend the winter months in a lower altitude—three thousand to thirty-eight hundred feet. These cases, which numbered about two hundred, had all improved immediately with this change, and the majority of them had returned to Colorado for the summer, these months being too hot in the intermediate altitudes.

Dr. Leonard Weber, of New York, indorsed this plan of sending patients to an intermediate altitude, but remarked that the profession did not now lay so much stress as formerly on a high altitude.

Dr. S. E. Solly, of Colorado Springs, said that this practice of sending patients to the lower altitudes of Arizona and New Mexico was very beneficial, particularly in advanced cases of patients having a rapid pulse, very susceptible to catching cold, and unable to take much exercise. The trouble with the lower altitudes was that there were not proper accommodations and food for such invalids.

WHY FUMIGATION OF APARTMENTS OCCUPIED BY TUBERCULOUS PATIENTS AT HEALTH RESORTS SHOULD BE UNDER MUNICIPAL CONTROL.—Dr. Charles F. McGahan, of Aiken, S. C., in this paper cited cases illustrative of the carelessness, ignorance, and cupidity of proprietors of these resorts as proof of the need for municipal supervision.

Dr. Charles Fox Gardiner said that after having made a series of negative inoculations of animals with dust from hotel rooms that had been inhabited by consumptives for many years, he had come to the conclusion that the danger from this source, though real, had been greatly exaggerated, and that it was better to feed these people well and teach them to open their windows.

Dr. Guy Hinsdale, of Philadelphia, said that probably the best way of disinfecting apartments was by exposing them to the sun, but where this was impracticable formaldehyde-gas disinfection, or some similar method, must be used.

SOME REMARKS ON CLIMATE IN RELATION TO RENAL DISEASE.—Dr. J. B. Walker, of Philadelphia, in this paper, spoke of the influence of variability of temperature and dampness, particularly of the soil, on persons affected with renal diseases. Cases of a certain class, he said, did well in the summer, but not so in the winter, unless sent to some place like Atlantic City or Lakewood.

Dr. R. C. Newton remarked that he could not recall having seen a single case of Bright's disease during a four years' residence at Fort Elliot, Texas. Here, although the people were very careless about eating and drinking, the soil and air were very dry.

Dr. Phillips averred that Atlantic City was, both absolutely and relatively, more moist than Philadelphia, but the temperature in the former was much more equable.

Dr. S. A. Fisk, of Denver, quoted a saying about the stock yards that the men could tell Western steers by their healthy kidneys. He had rarely met with renal disease in the West.

Dr. Henry Sewell said that in his part of the West local radiation and evaporation were very rapid, and the usual vasomotor disturbances did not seem to be so common as in the East.

Dr. L. Duncan Bulkley spoke of his personal experience during the past thirty years as a sufferer from renal insufficiency, and expressed the belief that his continued good health was largely attributable to keeping his skin protected, night and day, with pure woollen garments, and the habit of taking a quart of milk daily on an empty stomach.

Dr. N. S. Davis, Jr., quoted some interesting insurance statistics of deaths from renal diseases in five thousand cases. They showed that the highest mortality had been in the far West—California, Utah, etc.; the next highest in New Jersey and Pennsylvania; then in the Southern States, and then in New England and New York.

CLIMATE AS IT AFFECTS THE SKIN AND ITS DISEASES.—Dr. L. Duncan Bulkley, of New York, contributed a unique paper on this subject. He stated that certain cutaneous diseases which were common in one country would be almost never seen in another country. Thus, lupus and true prurigo were especially prevalent in Austria. Syphilis spread very easily in warm climates, but did not gain much of a foothold in cold countries such as Iceland and Greenland. The air along the great lakes seemed to predispose to eczema. Psoriasis would often disappear on removal to a warmer climate, and it was comparatively infrequent in the tropics. Acne

was aggravated by residence on the seashore. He had come to the conclusion that the value of mineral springs had been greatly overestimated.

HYGIENICS OF THE SKIN.—Dr. L. D. Judd, of Philadelphia, read a communication having this title. He advocated rubbing the skin in the morning with warm water, following this by cold water until the skin was all aglow. Soft linen or a soft crash towel should be used to dry the surface. It was well known, he said, that those who wore woollen clothing next the skin were very prone to catch cold; he therefore preferred porous linen. Wool was the proper material for outside garments, but it should be entirely discarded for underwear.

Underwear and Bathing.—Dr. Bulkley said that these views regarding woollen underwear were entirely at variance with his own belief and experience. It was exceedingly important to use woollen garments having no cotton. He did not favor frequent bathing so much as in the earlier days of his practice.

Mesh Linen Underwear.—Dr. Babcock said that he had tried the mesh linen underclothing, but had found that he could not keep warm without putting on another suit over it. With the linen he had not appreciated sudden changes of temperature so keenly, but had been unable to keep so warm as with woollen underclothing.

Dr. C. C. Ransom, of New York, said that an extensive experience with people working in Turkish baths had led him to believe that there was no real connection between much bathing and disease of the skin. He looked upon the cold morning plunge as pernicious for most people, and instructed his patients to take a bath at the temperature which was agreeable for them at that particular time, barring, of course, a decidedly warm bath.

Dr. Walker said that he was very fond of woollen clothing, both day and night, but as an undergarment there was nothing so agreeable to him as the linen mesh, though it was not durable and was expensive. Although one often felt cold while wearing this linen mesh, one did not often take cold.

Dr. Judson Daland, of Philadelphia, said that he would be loath to recommend the linen mesh underwear indiscriminately, though he believed most people erred on the side of wearing too much underwear.

HYDROTHERAPY IN THE TREATMENT OF INSOMNIA.—Dr. Irwin Hance, of Lakewood, read this paper. He said that in cases of in-

somnia there was usually some disturbance of the nervous and circulatory systems, and this explained why hydrotherapy proved so beneficial. He reported cases illustrating the benefit of hydrotherapy combined with static electricity, asserting that when he had used hydrotherapy alone the results, though good, had been attained much more slowly.

Dr. Ransom suggested that Dr. Hance would find a still larger field for hydrotherapy in these cases if he were careful to avoid great variations in temperature at the beginning of the treatment. Shocks were to be especially guarded against in the treatment of neurasthenics.

Second Day—Wednesday, May 10th.

THE CLIMATOLOGY OF NUDITY.—Dr. W. D. Robinson, of Philadelphia, read a paper with this title. He rehearsed the chief facts and laws of physics bearing upon the properties of light, heat, sound and electricity. He stated that the theory of light now most generally accepted was that light and electricity were identical. The object of the paper was to show the possible therapeutic value of light in disease. A number of cases of lupus, he said, had been cured by concentrating the sun's rays on the affected area. The so-called X-ray burns were apparently not burns, but the result of intense electrification.

Dr. Phillips said that he felt sure that climatologists would make greater advances by studying temperature (heat) and electricity than by giving so much attention to the air and to barometric pressure. It had been shown by experiment that there was a greater absorption of oxygen and elimination of carbon dioxide. It had also been found that the exposure of culture media to light before inoculating with germs produced such a powerful influence that it prevented the subsequent growth of the germs.

Dr. R. C. Newton recalled eight cases of typhoid fever of an exceedingly mild type observed by him among men who had been constantly out-doors on scout duty.

RECENT INQUIRIES CONCERNING THE BLOOD CHANGES INDUCED BY ALTITUDE.—Dr. S. E. Solly, of Colorado Springs, presented this communication. In it he detailed the experiments of various observers, notably those of Schomann and Rosenquist, on animals placed in bell-jars and subjected to various barometric

pressures. These investigators concluded that the changes in the blood occurring in connection with diminution of barometric pressure were best explained on the theory of an increased proliferation of the red cells. Dr. Solly's own experiments in Colorado had consisted largely in inquiring into the methods and sources of error in these blood examinations. The general result of this inquiry seemed to be confirmatory of the theory just mentioned.

Dr. E. O. Otis said that last year he had expressed himself as not convinced that this polycythæmia was a general one, and he was still inclined to believe that it existed only in the peripheral vessels. If there was a true increase in the general volume of the corpuscles, it was difficult to comprehend the rapid restoration of the normal state on the return of the individual to the sea-level.

Dr. A. Jacobi, of New York, said that altitude was not the only cause of a disproportion in the number of blood cells and in the percentage of hæmoglobin, as this condition was not infrequently observed in slow convalescence from various diseases.

Dr. Judson Daland, of Philadelphia, spoke of the many sources of error in blood examinations, even under the most modern and approved technique. For example, there was a large error introduced by the hæmatokrit, and dependent upon the velocity of rotation and the size of the corpuscles. With the Fleischl hæmometer there was necessarily a large personal equation. From the evidence that had been offered he felt reasonably sure that there was a blood regeneration in high altitudes.

Dr. Phillips asked Dr. Solly if he had any hypothesis to offer in explanation of the assumed changes in the blood. He was personally of the opinion that the evidence adduced pointed strongly toward an actual increase in the number of red blood cells and in the hæmoglobin. He had been able to account for this increase only by the influence of light on the hæmoglobin; and some recent experiments by Italian observers seemed to lend support to this view. These investigators had found that local irritations of the skin, as by a mustard plaster, was sufficient to cause an increase in the hæmoglobin, and this increase was much more noticeable when the body was exposed to sunlight.

Dr. Solly, in closing the discussion, said that the chief evidence of these changes in the blood had been noted in the laboratory, as a result of changes in the barometric pressure, and entirely independent of the influence of light.

ALTITUDE AND HEART DISEASE.—Dr. R. H. Babcock, of Chi-

cago, presented this paper, together with a report of nine cases. It was evident from these histories that it could not be said that every case of cardiac disease was affected injuriously. His conclusions were: (1) That all forms of cardiac disease did not contraindicate a sojourn in a high altitude; (2) the ill effects of low barometric pressure, in some forms of cardiac disease, were explicable by the accelerated venous flow and the quickened heart beat; (3) high altitude was most apt to prove incompatible in pronounced aortic and mitral stenosis, and in regurgitant disease when complicated by pleural or pericardial adhesions; and (4) uncomplicated regurgitant cases, with or without myocardial changes, might endure, without injury, low barometric pressure.

Dr. Sewall, of Denver, said that, in his opinion, the influence of metabolism on the circulation was very much more important than the mere mechanical factors. Very recent experiments had shown a remarkable reduction in the specific gravity of the blood in persons living at a high altitude. He was convinced that the right side of the heart in most individuals coming to Denver was overtaxed for a period of a few days or weeks, probably as a result of the increased aspiration into the thorax. According to his experience, cases of aortic regurgitation were most injuriously affected in a high altitude.

Dr. C. E. Quimby, of New York, said that with the removal of atmospheric pressure the reserve or hidden tension of the vessels was developed.

Functional Cardiac Murmurs.—Dr. A. Jacobi, of New York, read a brief abstract of his paper on this subject. His object was to prove that functional murmurs were very much less frequent than generally supposed, and were usually the result of disease of the myocardium.

Dr. E. Fletcher Ingals expressed the opinion that cases of alcoholic heart, coffee heart, and tobacco heart, if followed for years, would be found eventually to be examples of serious disease of the myocardium.

Dr. John C. Munro, of Boston, said that he had frequently noted the occurrence of a cardiac murmur in persons anticipating a surgical operation, which disappeared very promptly afterward.

Dr. Harold Williams, of Boston, said that he had been impressed with the occurrence of such murmurs in overtaxed hearts, apparently as a result of a too feeble contraction of the ventricle.

Dr. Jacobi, in closing, said that the temporary murmurs spoken

of were commonly observed in chorea. He did not believe in cardiac murmurs as a direct result of anæmia *per se*, but in cases of long-standing anæmia the muscles became enfeebled, and, as a result of this poor nutrition, an organic murmur appeared.

PROGNOSIS IN CHRONIC VALVULAR AFFECTIONS OF THE HEART.—Dr. N. S. Davis, of Chicago, presented this paper, based on two hundred and fifty cases in his own practice. He stated that, contrary to popular opinion, sudden death in heart disease was comparatively rare. It occurred in aortic regurgitation only, and, according to Broadbent, in about one-fourth of the cases. Of thirty fatal cases of which he had records, the age at death had been fifty years for mitral stenosis, forty for mitral insufficiency, and thirty-six for both aortic stenosis and insufficiency combined. Chronic valvular disease of rheumatic origin must be commonly regarded as intermittently progressive. The prognosis was influenced by the amount of hypertrophy already present, by habits of life, and by general nutrition. In one hundred and three cases, in which the duration of broken compensation could be ascertained, the average duration had been 2.6 years in mitral insufficiency, and the maximum seventeen years; in aortic stenosis the average had been 3.8 years, with a maximum of twenty years; in aortic insufficiency, the average had been 2.75 years, with a maximum of seven years. In general, those having stenosis of the aortic valves lived longer than those having insufficiency.

Dr. Roland G. Curtin, of Philadelphia, cautioned against making an unfavorable prognosis in heart disease because of the liability of unduly depressing the patient and aggravating the condition.

Dr. Babcock remarked that when two valvular lesions coexisted, the prognosis was better when they were of the same kind than when they were dissimilar.

TREATMENT OF THE CARDIAC ASTHENIA OF PNEUMONIA.—Dr. H. L. Elsner, of Syracuse, presented a contribution to this subject. He took the view that the toxæmia of pneumonia speedily resulted in cardiac asthenia and vasomotor paresis. Thus theoretically nitroglycerin should prove a dangerous remedy. He had never seen a patient recover from pneumonia who had been vigorously treated with this drug. His plan of treatment consisted in giving a mixture, composed of fifteen drops each of the compound spirits of ether, aromatic spirits of ammonia, the compound spirits of lavender, and the tincture of valerian, at intervals of an hour or two. In addition, he usually prescribed one-fourth of a grain of

sparteine sulphate and four to six grains of caffeine at intervals of four or six hours. He also thought well of giving tablespoonful doses of Hungarian wine every half-hour. He believed nitroglycerin was injurious except when the arteries were distinctly diseased and the pulse was persistently of high tension.

Dr. Walker said that he had had most excellent results from nitroglycerin in pneumonia. He also used dry cups very freely.

Dr. Curtin remarked that the action of nitroglycerin was so evanescent that it should be administered at intervals of two hours.

Dr. Daland said that he had given to three individuals, suffering from slight bronchitis, as much as one-fourth of a grain, four times a day, without any effect. He thought venesection most useful in pneumonia when the right heart was overtaxed.

Dr. Babcock spoke in defence of the use of nitroglycerin, and asserted that it was both safe and efficient if the dose of one one-hundredth of a grain by the mouth was not exceeded.

Dr. A. Jacobi said that digitalin was not an alkaloid, but a resinoid, and after many years of trial, he had discarded it as utterly useless.

THE CARDIO-ŒSOPHAGEAL "GUSH" AND "CLICK."—Dr. Roland G. Curtin, of Philadelphia, reported cases in which these curious sounds were heard. His reasons for believing them to be of œsophageal origin were: (1) The sound seemed to come from the mouth; (2) closing the mouth muffled the sound; and (3) it was not audible below the middle of the sternum. It was probable that the heart in diastole pressed out a small quantity of air, and that this was readmitted during systole. The sounds were heard with the diastole of the heart, over the middle of the sternum, and were not transmitted to other parts.

EMPYEMA FROM A SURGICAL STANDPOINT.—Dr. John C. Munro, of Boston, read this paper. In his opinion, there were very few adult cases of empyema in which ether could not be safely given by a skilled anæsthetist, but unless so given it was likely to be dangerous, though not more so than chloroform. He had had delayed or poor expansion in both streptococcic and pneumococcic cases; it was apt to be slower in the latter class. The deaths, in his cases, had been from the dislodgment of emboli, from relapse or extension of a pneumonia, and, in the pneumococcus cases, from rapid and general infection. He rarely operated in these cases without resection of rib, and preferred to make the opening in the seventh or eighth interspace. The drainage was as good when the

incision was made anteriorly or in the mid-axillary line as if made posteriorly in less accessible parts. These patients improved more rapidly if allowed to sit up as soon after the operation as this could be safely done. Systematic gymnastic exercise and the use of the pneumatic cabinet were useful in aiding chest expansion.

Dr. Curtin suggested that chest expansion could be most conveniently obtained by sending the patient to an elevated region and instructing him to ride a rough-trotting horse.

Dr. Elsner said that sudden death on the operating-table might often be averted by operating from the back instead of turning the patient on the side.

Dr. A. Jacobi remarked that with children ether should always be used, not chloroform.

TRAUMATIC RUPTURE OF THE HEART WITHOUT PENETRATION OF THE CHEST WALL.—Dr. Richard C. Newton, of Montclair, N. J., reported a case of this kind coming under his observation, due to a blow on the chest received in a bicycle accident. There had been coincident fracture of the sixth intercostal cartilage. The person lived about one hour. The autopsy showed no disease of the pericardium. The speaker said that such ruptures of the heart were very rare, but he had been able to find a few cases on record. In one of these the rupture was produced by a blow on the chest with a bamboo cane. The longest time this injury had been survived was fourteen hours.

BICYCLING IN ITS RELATION TO HEART DISEASE.—Dr. A. C. Getchell, of Worcester, Mass., read a paper on this subject. He said that dilatation of the heart not uncommonly occurred in untrained riders. The long-continued muscular exertion caused an accumulation of toxins in the blood, and this, together with the prolonged acceleration of the pulse, resulted in enfeeblement of the heart. The existence of this toxæmia was proved by the common occurrence of a mild "fatigue" fever. Acute dilatation, if often repeated, would permanently damage the heart. He protested against the growing custom of permitting children under fourteen years of age to ride indiscriminately even on smooth and level streets. Many cases of "bicycle heart" had been detected by those examining recruits for the late war. Young adults were less likely to be injuriously affected by bicycle riding, but those undertaking it after the age of forty should be cautious about riding up hills or against strong winds, and the gear of the bicycle

should be moderate. These people should seek medical advice before attempting to ride.

THE RELATION OF LOCAL METEOROLOGICAL CONDITIONS TO THE INFLUENZA EPIDEMIC IN PHILADELPHIA IN THE WINTER OF 1898-99.—Dr. Howard S. Anders, of Philadelphia, in this paper reviewed the literature. He said that in the recent epidemic the mean atmospheric pressure had been moderately high for the two months preceding the outbreak. In the corresponding months of the previous year, when there had been but little influenza, the pressure had been much less. The weather had been slightly colder during the outbreak than in the previous year at this time. The temperature during November and December, 1898, had been decided equable.

THE COLD WAVE OF FEBRUARY, 1899.—Dr. Guy Hinsdale, of Philadelphia, in this paper presented a résumé of the chief events of this memorable period, and traced the course of the cold wave. One hundred and four persons had lost their lives between January 29 and February 13, 1899, by freezing and by avalanche in Colorado. The new records established for Washington and Philadelphia were respectively 15 degrees and 6 degrees Fahr. below zero.

THE EFFECT OF VIOLENT AND PROLONGED MUSCULAR EXERCISE UPON THE HEART.—Dr. Harold Williams, of Boston, read a paper with this title, based upon observations made on seventeen vigorous men before and after a cross-country run of twenty-five miles. Fourteen completed the distance, the best time being two hours and fifty-four minutes. Percussion of the heart was made independently by three examiners. Very slight dilatation of the left ventricle was noted in all of them after a rest. Some of them lost five degrees in temperature, and some lost six pounds in weight. One curious fact shown by the pulse tracings was that this violent muscular exercise was attended by a low arterial tension. Albuminuria, when present, was usually associated with casts. In eleven of the thirteen men examined after the race by auscultation there was a murmur along the left side of the heart, at the apex, in the back—a true mitral regurgitant murmur. It was apparently due to the participation of the most muscular part of the heart in the general exhaustion. The murmur lasted from a few minutes to half an hour, and the men were not permanently injured.

A CASE OF ANEURISM.—Dr. Thomas Darlington, of New York, reported this case, which was interesting because of the peculiar mode of rupture. The aneurism caused absorption of the sternum, and then ruptured during an attack of coughing. About a pint of blood was projected against the ceiling, and then a clot plugged the opening and caused a cessation of the hemorrhage. Death occurred subsequently from rupture at another spot.

OFFICERS ELECTED.—President, Dr. A. Jacobi, of New York; Vice-Presidents, Dr. R. H. Babcock, of Chicago, and J. W. Brannan, of New York; Secretary and Treasurer, Dr. Guy Hinsdale, of Philadelphia; Member of Council, Dr. Beverley Robinson, of New York.

THE LOOMIS SANITARIUM.

Thursday, May 11, was a veritable third day's session of the Climatological Association, occupied by a visit to the Loomis Sanitarium for Consumptives, at Liberty, N. Y., to which they were invited by the trustees of that institution.

Through the courtesy of the Ontario & Western Railroad, a special train was provided for them. They were met at the ferry at 9 o'clock by Dr. Stubbert, member of the board of trustees and physician in charge of the institution, who courteously devoted the day to their interest and enjoyment. Though not in the early part an ideal day for sightseeing, the weather cleared in the afternoon, and gave an excellent opportunity to judge of the beautiful scenery and the invigorating mountain air. The opportunity to see the sanitarium and its surroundings under the unfavorable circumstances of a rainy day was not without its advantages, since it afforded an excellent idea of how light and free from depressing influences the atmosphere of the place is compared to that of the city and sea coast during rainy weather.

After a generous luncheon a visit in parties of eight or ten was made under the guidance of nurses and physicians to the dozen or more houses that make up the sanitarium. The institution is able to accommodate about seventy patients, and has at present very nearly that number of inmates. The charges per week are from $12 to $25, and at present there is difficulty in providing accommodations for all those who desire to come. There is a resident medical staff and eighteen nurses at the institution, though the infirmary is not large and is intended rather for intercurrent illness among the patients than for those who are confined to their rooms

and require constant medical care because of their advanced tuberculous condition. The latter class of cases is not deemed desirable, and there exists a city branch of the sanitarium for patients deemed incurable. The city branch is not self-supporting, but the sanitarium at Liberty is expected to be, and is proving itself to be.

That the directors of the Loomis Sanitarium were not mistaken in their opinion that there was need for an institution where a class of patients would get sanitarium treatment for tuberculosis for which they were able and willing to pay reasonable charges, if certain comforts and a certain amount of exclusiveness and association with others of their class were provided for them, is evident from the financial success of the institution. That the methods employed and the situation are eminently favorable factors for the treatment of tuberculosis is clear from the published results, which are excellent, and which bear comparison with the results of sanitarium treatment anywhere in the world.

A feature of the nurses' training at the sanitarium seems to deserve special notice. After the regular training of two years is finished nurses may stay for post-graduate work, which consists of practice in details designed to fit them for rendering assistance to doctors in their offices. They are taught the microscopy of sputum, the chemical and microscopical examination of urine, the keeping of doctors' accounts, and the making of abstracts from medical journals, including as far as possible abstracts from German and French; in a word, everything that will enable them to relieve the physician of certain routine work for which he often finds it difficult to get the time.

The members of the Climatological Association returned to New York City by their special train late in the evening, well pleased with their visit, and with many expressions of confidence in the future of the sanitarium treatment of tuberculosis as it is conducted at no great distance from the patients' homes.

Hail holy LIGHT, offspring of Heaven first born,
Or of the eternal co-eternal beam,
May I express thee unblamed? since God is light,
And never but in unapproached light,
Dwelt from Eternity, dwell then in thee,
Bright effluence of bright essence increate.

—*Milton.*

CONFERENCE OF THE STATE AND PROVINCIAL BOARDS OF HEALTH.

FOURTEENTH ANNUAL MEETING, AT RICHMOND, VA., MAY 23-24, 1899.

ABSTRACT OF THE PROCEEDINGS.

Seventeen States of the Union and the Province of Quebec were represented. Several States had more than one delegate in attendance.

The conference was called to order in the assembly room at the Jefferson at 10 o'clock on the morning of the 23d by Dr. Felix Formento, of New Orleans, the president. Dr. Paulus A. Irving, secretary of the State Board of Health of Virginia, in a few words introduced Governor Tyler, who delivered a brief address of welcome. Three pertinent anecdotes, told by His Excellency, evoked hearty applause.

The address of Dr. Formento, the president, followed. In the course of his remarks he said:

"It is hardly proper to speak of one's self, yet I cannot control the sentiments of grateful memory that fill my heart at this moment, for this city of Richmond was the scene of my earliest professional achievements and of some of the happiest days of my life. It was here that at the age of 24, and only three months after my marriage, I was placed at the head of the Louisiana Hospital, established in the buildings of your old Baptist College, on Broad street. This institution, which at times accommodated three and four hundred soldiers, sick and wounded, was not only a hospital, but a home for those far away from their family ties; a place of rest, a depot for necessities and delicacies furnished our soldiers by their generous fellow-citizens.

"Innumerable memories of those eventful and terrible years rush to my mind and overwhelm my heart on this day, when, after so many years, I once more find myself in Richmond, among a people endeared to Louisiana by so many ties. How many events have taken place since then! How different the conditions of to-day! Thank God, the war of the Confederacy is now to most of us but a dream of the past. Our new generation hardly knows it ever existed! Our country is now forever united; a new baptism of

blood and fire has cemented this reunion! Recent glorious victories achieved by the blue and the gray, fighting shoulder to shoulder under the grand old flag, for the cause of humanity and civilization, have made this nation truly 'one and indissoluble!' "

Danger of Yellow Fever.

Proceeding to the purpose of the conference, he dwelt especially upon the importance of extra precautions to prevent the importation of infectious diseases from the new possessions of the United States. He said that "of all foreign infections which threaten this country, yellow fever is the one to be most dreaded. The plague has not always limited itself to the South, and the danger of more northerly sections becoming infected is greater now than ever before, owing to all parts of the country being so closely connected by means of rail and steamship lines.

"To guard against this importation, to protect as far as practicable our extended shores, there seems to be one system which, while securing protection to the whole country, offers justice and impartiality to all sections, North and South, with no undue discriminating commercial advantages to one port over another. This system can only be enforced by the United States Government. It consists in the disinfection of all ships, with their crews, passengers, and merchandise, sailing from an infected port for any port of the United States, at the very point of departure, and not at the home port of arrival, where varying State and local laws and interests are often in conflict and quarantine practices often entirely inefficient. The same rigid regulations should apply to all points of destination, North as well as South, for nowadays, with our unlimited railroad facilities, the disease, once introduced through any of our ports, may soon be carried all over the country, developing and spreading naturally in those sections whose climate and local conditions are most favorable to the disease. All home ports should be put on the same footing and the same measures should apply to all passengers, whether destined to Northern or Southern points. A ship having been disinfected and purified at Habana, for instance, arriving at an American port would only be detained at quarantine for a sufficient time to cover the period of incubation. This system would render impossible an occurrence which I have often witnessed in New Orleans—namely, the arrival in that city of passengers, baggage and merchandise from Habana via Tampa or New York (with little or no restrictions)

several days before the release from our Mississippi quarantine station of steamers which had left Habana direct for New Orleans on the very day those coming via New York had sailed from Habana."

In conclusion, Dr. Formento stated that since preparing his address he had learned that vessels destined to some parts are recently being disinfected at Habana. "If this is done by the government, it is a move in the proper direction and serves to confirm my views on the subject."

But to be really efficacious, he thought the system should be practiced in all infected ports and should apply indiscriminately to vessels sailing for all American ports.

Dr. Martin and Dr. Culpeper, of the Virginia Board of Health, made short addresses of welcome, and the reports of Dr. Hurty, of Indianapolis, secretary, and Dr. Pelletier, of Quebec, the treasurer, were received and adopted.

The conference then heard a paper by Dr. Bracken, of Minnesota, on "The Functions of the Conference of State and Provincial Boards of Health." At the conclusion of the discussion adjournment was taken to 2 o'clock P. M.

The afternoon session was devoted to the reading and discussion of a number of papers. Among the topics discussed were: "The Shortest Road to Ideal Sanitation—Education," proposed by Oklahoma; "Danger of Infection to the Countries Represented by This Association from the New Possessions of the United States, and the Best Measures to Prevent or Diminish Such Danger," proposed by Louisiana; "The Value of Veterinarians on State Boards of Health," proposed by Washington State; "To What Extent Should Quarantine Restrictions be Carried in Regard to (a) Persons Who Have Been Exposed to Smallpox, (b) the Families of Such Persons?" proposed by Ohio; "When Vaccination of School Children is Ordered, What Length of Time Since Former Successful Vaccination Should Excuse One from Vaccination?" also proposed by Ohio; "Should We Have a National Department of Health?" proposed by Indiana.

The discussions elicited by the last two were interesting and animated. Dr. Standlee, of Missouri, led in the discussion of the topic regarding length of time during which vaccination is efficacious. His conclusions were, that the child should be vaccinated when between two and six years of age, and that thereafter should be vaccinated every seventh year.

Spooner Bill Endorsed.

The leading paper on the establishment of a national department of health was read by Dr. Wingate, of Wisconsin. He discussed at length the features of the Spooner bill before the last Congress, which proposed the establishment of a national bureau of public health, and the Caffery bill, which proposed broadening the scope of the Marine Hospital Service so that it would include the work now done by State boards.

A motion was made to endorse the Spooner bill, but this met with strong opposition from Dr. Cooper, of Delaware. He thought the National Government should do all possible to educate the people in the science of sanitation, but that public health regulation was essentially a local matter, to be dealt with by State authorities.

Dr. Thomas, of North Carolina, thought the Caffery bill preferable to the Spooner bill, for the reason that the Marine Hospital Service was not under control of politicians, while the head of the bureau to be established by the Spooner bill would be directly under the control of politicians.

After some further discussion the conference voted to endorse the Spooner bill, three delegates not voting.

The conference, at 5:30, adjourned until 8 o'clock.

The night session opened with the discussion of the question as to whether State universities should have a department of hygiene for the training of men who wish to become members of boards of health. The consensus of opinion was that the future health officer would be specially trained. The curative doctor has to deal with curative agents, the health officer with preventive medicine.

The next topic was "A State or Province not being ready, for various reasons, to undertake the complete and progressive eradication of tuberculosis among cattle, as undertaken in other States, its State or Provincial Board wishes at least to have sufficient laws to enable it to protect, in a fair measure, milk and meat supply. What legislative enactments (clauses ready for presentation to Legislature desired) would be considered fairly adequate to this end?" proposed by Quebec. Dr. Jones, of New York, read a paper on the subject. Among other things which he advocated was public abattoirs, requiring the careful inspection of cattle before being slaughtered. He thought it desirable to give to State boards of health the power to destroy all animals infected with tuberculosis. This and other measures, he thought, would be valuable, not only in getting rid of animals actually diseased, but as educational object lessons, now sadly needed.

Anti-Tuberculous Laws.

Dr. Pelletier, of Quebec, read a paper whose conclusions indicated that he had given the subject of the eradication of tuberculosis exhaustive study. He held that all animals, alive or dead, should be subject to inspection; that every owner having an animal known to be suffering from a contagious disease, or every veterinarian knowing of the existence of such affections, must report the same to the proper authority. The owner of an animal suffering from such disease should not be allowed to sell it without informing the buyer of the fact. He thought it important that laws regarding the importation of diseased cattle should be strict, and that any animal which belongs to the food class, when affected by any disease, whether contagious or not, should be killed only in the presence of an inspector.

Dr. Bracken, of Minnesota, followed Dr. Pelletier. In course of his remarks, he stated the popular belief that cows whose udders were not affected furnished uninfected milk had been proven to be incorrect.

Dr. Probst, of Ohio, thought too much attention was being paid to animals already diseased, and not enough to those liable to become so. He thought the ventilation, temperature and lighting of cow stables very important questions in considering the prevention of tuberculosis.

Dr. Standlee, of Missouri, accentuated the importance of proper air and light for the prevention of tuberculosis.

Dr. Hurty explained what was being done in Indiana to stamp out the disease. The newspapers were first used to stir up public sentiment to the dangers of the plague, and then the Indianapolis Board of Health induced a dairyman to have his sheds made to conform to the proper sanitary model, and then to have his cattle tested for disease, the board promising to give him a certificate setting forth that his cows had been tested and were healthy. The day this certificate was published the dairyman was overrun with customers, and all the dairymen in the city wanted their cows tested. Every dairy herd supplying Indianapolis is now tested. He gave other instances of what had been accomplished in Indiana towns in the direction of purer milk.

Dr. Fulton, of Maryland, argued for the importance of giving more attention to the question of pure food for animals, especially milch cows.

The conference adjourned at 10 o'clock.

During the forenoon of the second day, two papers read create-

a good deal of interest and attention on the part of those present. The first one was proposed by the Board of the State of Illinois by Dr. Eagan, of that State. It treated on the following subject: "What has been done by the States and Provinces represented in the conference toward enforcing the rules governing the transportation of dead bodies?"

Dr. Eagan was not present at the meeting, and his paper had to be read by the secretary; yet it created much interest and the contents were highly approved by those present.

The next paper was on "What is the best system of quarantine?" by Dr. Sanders, of Alabama, on which there was considerable discussion.

The afternoon session opened at 2 o'clock, and during the session the following papers were read and discussed:

"To what extent should quarantine restrictions be carried in regard to (a) persons who have been exposed to smallpox, (b) the families of such persons?" The paper, which had been proposed by the State Board of Ohio, was read by Dr. Probst of that State, and the general discussion was opened by Dr. Lee, of Pennsylvania, and Dr. Watson, of New Hampshire.

Next followed a second paper proposed by the State Board of Health of Ohio on, "When vaccination of school children is ordered, what length of time since former successful vaccination should excuse one from vaccination?" The paper was read by Dr. Standlee, of Missouri, and the discussion on the same was opened by Dr. Mitchell, of New Jersey, and Dr. Thomas, of North Carolina.

"Does Vaccination Protect?"

This was the subject of a paper by Dr. J. S. Fulton, of Maryland, in part as follows:

"Of all the diseases which have ever afflicted mankind, smallpox has had the most remarkable history. For centuries it was, as Macaulay says, 'the most terrible of all the ministers of death.' In the eighteenth century it destroyed in Europe not less than two thousand persons per million living, and some observers place the mortality at three thousand per million. It permanently disabled a far larger number, while the marks of its work were visible on the face of four-fifths of the entire population. It was a greater enemy of female beauty than the pencil of time, and to have reached marriageable age without bearing any of its hateful marks was both a distinction and an advantage to a girl of any social

rank. To invoke smallpox upon another was a favorite malediction.

"Household servants found it an important item of recommendation to have had the smallpox, and advertisements for servants often made it a necessary qualification that applicants should have had smallpox. Very many believed with Rhazes, that smallpox was necessary, a sort of physiological fermentation in the blood, which ripened the infantile fluid into the blood of maturity. No one expected to escape the disease, and but two persons in every hundred were so fortunate.

"In an account of smallpox at the little town of Ware, in 1722, we are told that out of 2,515 persons 1,601 had had smallpox in previous years, leaving 914 to have it in 1722. Of these 914, 612 had it in 1722, leaving 302 persons who are not set down as immunes, but as the predestined victims of smallpox at the next inning, in the words of the record, 'to have smallpox.' Such was everywhere the attitude of the public mind, and that, too, in a time when the great bulk of the people were immune through previous attacks of the disease, and the brunt of every outbreak fell upon the relatively few people who had not had it. Could any motive but daily dread of this ever-present scourge, could anything less than a sense of impending doom have driven those who were free from its attack to take money from their purses and pay for the privilege of being inoculated with smallpox at the hands of the doctors? Catherine, Empress of Russia, gave Dinsdale $50,000 for inoculating her, and an annuity besides of $2,500 for the remainder of his life.

"No such terror now oppresses mankind, and to the great masses of civilized people smallpox is but the name of an unknown horror. This great deliverance must have come through one of two causes, either smallpox must have lost its malign power, or humanity must have acquired some sort of immunity. That smallpox is to-day no less able to destroy human life than formerly is demonstrated whenever it attacks susceptible communities. Only ten years ago it invaded a town of 10,000 inhabitants in Finisterre, killing 1,931 people. Its ravages to-day in some quarters of the earth are as merciless as in Europe during the last century. The immunity which the dominant nations enjoy is not possessed by certain other nations. Furthermore, the immunity which enables these dominant nations to go to and fro in the earth more safely than other people can dwell at home is not a racial characteristic, but is the personal property of their teeming thousands of citizens,

and the outward and visible sign of their safety is a mark or marks like that which Edward Jenner bestowed on James Phipps on May 14, 1796. It is only among those nations who have accepted this benefaction, and in proportion as they have accepted it, that one can demonstrate the subjugation of smallpox."

At the conclusion of this discussion the committee appointed last year to revise the bylaws, presented its report, and a number of rather unimportant amendments was agreed to. It was decided that the admission fee for a new board should be raised from five to ten dollars.

Officers Elected.

The following officers were then elected for the ensuing year:

President, Dr. Hugh O. B. Wingate, of Milwaukee, Wis.

Vice-President, Dr. Probst, of Ohio.

Secretary, Dr. Hurty, of Indianapolis (re-elected).

Treasurer, Dr. Pelletier, of Quebec (re-elected).

Dr. Bracken, of Minnesota; Dr. Swarts, of Rhode Island, and Dr. Fulton, of Maryland, were elected members of the Committee on Programme, and the question of selecting the meeting place for the next conference was referred to the Executive Committee and the Committee on Programme.

The newly-elected officers were then introduced, and took their places with some brief appropriate remarks.

CO-OPERATIVE SANITATION—STATE AND NATIONAL.

Charleston, S. C., May 5, 1899.—At the regular meeting of the Board of Health, May 3, it was resolved to give instructions to the sanitary inspectors to devote their whole attention during Reunion week to inspecting the different localities of the city where large congregations or gatherings of visitors may be had, and to at once relieve all sanitary nuisances that may occur; also it was resolved to ask the superintendent of streets to provide whatever labor may be required to clean up all nuisances, and to secure all additional carts for hauling away any rapidly accumulating garbage or other objectionable matter. Additional inspectors will be employed if necessary.

The following report from Dr. W. F. Brunner, sanitary inspec-

tor at Havana, was read, and the board expressed the opinion that the subject matter of the recent additional disinfecting plant established by the General Government of the United States at Havana should be given wide publicity:

Havana, April 21, 1899.

The work of disinfecting vessels bound for ports in the United States began on April 3, and up to the 20th instant 20 vessels had been disinfected. The class of vessels treated here were as follows: Steamers, 4; barks, 1; schooners, 14.

These vessels were bound for different ports in the Gulf and on the South Atlantic coast. One vessel, a steamer from Charleston, S. C., came here with a general cargo from that city, and by special request of Dr. Horlbeck, health officer of the City of Charleston, she was disinfected in order that she could proceed to Central American ports for a cargo of fruit, and then return to her original port of departure.

By disinfection here this vessel was the pioneer of a trade made possible between Southern ports and Havana, and I look on this new departure as the greatest help to Southern commerce ever extended by the National Government, and a help which is beyond the reach of municipal or State boards of health.

I cannot see why Southern ports should not enjoy now many advantages heretofore not available to them.

The disinfecting plant has worked rapidly, but, what is more to the purpose, efficiently, in nearly every detail. The work was begun and nearly all of it conducted under the personal supervision of Surgeon H. R. Carter. No further endorsement is necessary, as I take it that his work would be accepted at any port in the United States. Every detail of the work has increased at this port, and a short statement, with a few figures, will demonstrate this fact. We have examined over 9,000 persons since January 1. This number does not include several thousand soldiers, and we have inspected 520 vessels leaving this port since January 1. The quarantine work done here during the present year will be greater than that of any other port in the world.

Following is a brief report of the work being done by the barge Protector at Havana, under the supervision of Surgeon H. R. Carter:

A brief report of what we are doing and purpose to do with the Protector may be of interest.

I am at present directing the disinfecting work, giving it my personal supervision.

The Protector is lying in the "Triscornia," a bight of the harbor on the side opposite Havana, between the wharf (building by the United States) and Santa Catalina, about one-third to one-half mile from shore, which, except for the Standard Oil Company's plant, is here uninhabited, and receives no creek or river. It is the best place in the harbor, and I consider free from infection from shore.

It is purposed, save in exceptional instances, to send vessels which have or have had yellow fever aboard to Tortugas, or in the case of steamers, to disinfect them with their own steam without coming alongside. In addition the floor of the hold where the disinfecting is done, and the deck of the Protector, is washed down every other day with bichloride solution as a routine measure, and whenever it is necessary to wet the deck to prevent injury by sun, this is done with the same solution; similarly the hold whenever material adjudged doubtful is handled there.

It is purposed to disinfect the whole barge once a week, using Tuesday, or the next day possible thereafter, for that purpose. We have packed up and disinfected all material fabrics not in daily use.

It is purposed for vessels to come alongside or close enough to take a line and haul alongside. They are directed to have the hold and soforth mechanically clean, and to have their dunnage ready—to be ready for disinfection in general—the same orders as are given to vessels coming to the wharf at a quarantine station.

The work of disinfection needs no description; it is what is done at other quarantine stations. The plant, taken altogether, is the best I have ever seen, the quickest in work, with the least chance of inefficient work.

After using it awhile minor improvements will undoubtedly suggest themselves, affecting rapidity of work and economy, durability and non-injury of material during disinfection, rather than efficiency.

A considerable number of vessels have been disinfected here—18 to date. They leave hatches closed the day of completion of disinfection, i. e., the day the fabrics are steamed. holds washed down and deck houses treated.

TYPHOID BACILLUS IN RELATION TO THE SOIL.

The medical report of the local government board of London for 1898, recently issued, gives an account of some important experiments made to ascertain the ability of typhoid bacillus to maintain its existence in organically-polluted and in virgin soil.

The report states that on testing each of twenty-one samples of soil qualitatively and quantitatively for bacillus enteritidis sporogenes, Dr. Houston ascertained that in none of three virgin soils almost free from vegetable organic matter, nor in other three virgin soils which abounded more or less in vegetable matter, nor in an unmanured orchard soil, could the presence of spores of this microbe be detected; that in the case of other three soils abounding in vegetable organic matter, but reputedly virgin, and also in the case of certain unmanured orchard and garden soils, spores of bacillus enteritidis, although detectable, were for the most part present in relatively small quantity only; whereas in every one of other five soils, an orchard and four manured garden soils, these spores were not only readily found, but were present in greater relative amount than in similar soils which were unmanured, or in three reputedly virgin soils which had been found to contain them.

Finally, in a sample of soil which had been recently and heavily exposed to pollution by excrement, and in one other soil which probably had been more remotely exposed to considerable excremental pollution, spores of bacillus enteritidis were found in exceptionally large quantity.

In continuation of his researches into the viability of the typhoid bacillus in sterilized soil, Dr. Martin has submitted to experiment nine additional samples of earth. Soils obviously polluted with animal organic matter sustained, while virgin soils proved hostile to, the life processes of the microbe. Virgin soils were hostile in the above sense, whether or not they contained abundance of vegetable organic matter. In sterilized soils favorable to typhoid bacillus, diverse temperature, provided always the soil remained moist, made little difference to the microbe. It maintained itself in such soil at 37 degrees Centigrade (98° Fahrenheit) at the ordinary temperature of the laboratory, and also under the temperature conditions (3 degrees to 16 degrees Centigrade) of an out-of-door shed. In a particular experiment with sterile organically polluted

soil, the typhoid bacillus maintained its existence for 456 days; and, furthermore, toward the end of this period this "soil culture" of the bacillus, after it had been dried and powdered to dust, still yielded the microbe in viable condition, and, presumably, in virulent phase.

Dr. Martin's more difficult task of testing the ability of the typhoid bacillus to maintain itself in soil in which it is brought in competition with other bacteria is as yet in its initial stages, but has already yielded interesting results in one instance. To a mixture of the several sterilized soils which were found favorable to the life processes of the typhoid bacillus, and in which bacteria belonging to the bacillus coli group were ascertained to be predominant micro-organisms, he added broth culture of the typhoid bacillus in the usual way, and placed the sample thus inoculated in an outdoor shed, the temperature of which ranged during the experiment between 3 degrees and 16 degrees C. At the end of fifty days the typhoid bacillus was recoverable from this soil at the point at which it had been inoculated. It had survived in competition with the bacillus coli and like micro-organisms, but had not multiplied.

The same report says: Notwithstanding that the bacteriologist has since 1882 come to our aid, it may be doubted whether we are yet in possession of laboratory methods for the prompt and certain recognition of uniform purity and safety of water.

THE PLAGUE AND ITS LOCAL CONDITIONS.

A paper read at a recent meeting of the Society of Arts, London, by Mr. Birdwood, late of the Governor's Council, Bombay, was of unusual interest in that he particularly described the specific germ of the disease, and gave an account of its discovery by the two Japanese physicians in Hong Kong, in 1894.

But the striking feature, and the most important bearing of his remarks was his description of the relation of unsanitary conditions to plague. For, he said in substance, all authorities are now agreed that the accumulations of filth in streets and houses, the defective disposal of refuse of all kinds, the overcrowding and insufficient ventilation of dwellings, the frightful misery resulting from disregard of considerations of rational hygiene, in all that relates to dwellings, clothing and the like, had always fostered the epi-

demic prevalence of plague. As for the future, all he could say was that it was open to them to cherish the hope that in the new Bombay, with an effective drainage system, well-ventilated streets and properly-regulated dwellings for the poor, the plague germ would never again find a congenial home. As to whether the plague bacillus can be eradicated is not quite so certain.

In the course of the discussion which followed Sir Richard Thorne Thorne attributed the outbreak largely to the soil, and pointed out that it was not so much the removal of the bacillus that was wanted as the removal of the conditions under which it multiplied. He particularly condemned the "chawls" in which the chief part of the poorer native classes in Bombay are housed, as offering a fertile soil for the spread of the plague, and expressed an opinion that it was a marvel that half the population was not carried away, and that it would be a good thing if the whole of the portion of Bombay in which they are situated were burnt down.

Investigations are being conducted under the auspices of Sir Richard Thorne Thorne as to the behavior of germs in the soil, and the theory—and a highly plausible one it is—has been broached to the effect that disease-producing or pathogenic germs may simply be modifications of others which in ordinary conditions are harmless. In other words, the theory means that a bacillus normally harmless, or only moderately hurtful, may be developed into forms of greater activity and virulence by soil, temperature, food and other circumstances. If the hypothesis can be verified at all, it would explain much that is at present puzzling in connection with other epidemics besides the plague. It is a very different state of affairs if we have to consider each disease-producing bacillus as a distinct species and an infectious disease as something which can only arise from a pre-existing case.

Mr. Ackworth, late municipal commissioner in Bombay, described the difficulties experienced by the authorities in inducing the municipality to improve the sanitation of the city. He considers that at present the great sanitary need of Bombay is effective drainage on the water-carriage system and the burning of all street sweepings.

The world's INFECTIOUS; few bring back at eve
Immaculate, the Manners of the noon.
Something we thought is blotted; we resolved,
Is shaken; we renounced, returns again.

—*Young.*

TEXAS "SANITATION" BY FORCE AND ARMS.

Mark Twain, in his inimitable story, "A Nevada Funeral," tells of the arrangements made to give the "late lamented" Buck Fanshaw a "good send off." One Scotty Briggs, closest friend and chief mourner, went in search of a minister of the gospel. He had some difficulty in making the local preacher, a newly arrived little "pale theological student from Boston," understand his wishes when he inquired: "Are you the duck that runs the doxology works?" but finally succeeded when he said that he was in search of "a gospel sharp to chuck chin music" over the remains of a friend—"the whitest man that ever lived," a man who "never shook his mother." Catching on by and by, the little preacher began to question Scotty as to the facts in the life of deceased, so as to prepare a suitable tribute to his memory; and among other things, he asked: "Was your friend, the late Mr. Fanshaw, a peaceable man?"

"Peaceable!" exclaimed Scotty, "he was the damndest peaceable man you ever *seen!* He would *have* peace. Why, I saw him lick eleven 'greasers' in fifteen minutes because they wouldn't be peaceable!"

(Uncle Sam seems to be of Scotty's way of thinking, with regard to the Filipinos; but "that's another story.")

The wherefore of the foregoing remarks is to be found in the recent "stamping out" (?) of the smallpox epidemic in Laredo—*vi et armis;* "sanitation" with gatling-gun adjunct.

Under the law in Texas, each county is required to deal with local epidemics, and to pay the expense. I will remark here, incidentally, that in 1895 one case of smallpox cost Nacogdoches county nine hundred and fifty dollars, and a small outbreak in Navarro county (I think it was Navarro) cost the county over eighteen hundred dollars. (See Swearingen's report for that year.) The law provides, however, that in case of failure or refusal of the county authorities to take hold of the matter, supposing an outbreak of smallpox or other epidemic disease to occur, the State shall assume charge; but I do not know of any warrant in law for removing smallpox patients from their own homes to a pest house in opposition to the wishes of the family, and certainly none for doing so at the mouth of a gun in the hands of United States cavalrymen, backed by a gatling-gun in position.

This was done at Laredo. Nor do I know of any warrant in law for burning an infected house, as was done in Dallas some years ago, and no remuneration to the owner.

Laredo, as everybody knows, is on the Rio Grande, at the crossing of the Texas-Mexican Railroad. The Rio Grande is the boundary between Texas and Mexico for several hundred miles. It is the policy of the State to keep an inspector on duty all the year round at each of the three railroad crossings, Laredo, El Paso and Eagle Pass. These gentlemen get, each, $1,800 a year. They have nothing to do with local epidemics; they only mind the gap. The other expense of keeping up these stations varies, and cuts no particular figure here. I am aiming only to show the want of wisdom displayed in eternally dealing with effects, and ignoring *causes;* and that a wiser course could be pursued whereby this absurd situation would not be necessary. The river is fordable at almost any point for five hundred miles the greater part of each year. It would require a standing army, say a thousand guards, to successfully guard the border against the crossing of Mexicans into Texas, and the State's policy of minding the three railroad crossings only, is like bolting the door of one's own house and leaving the windows wide open. Smallpox gained such headway in Laredo that the citizens called on the State to take charge. Mr. Sayers asked the Legislature, now in session, to give the State Health Officer $2,000—outside of the regular appropriation—with which to "handle the case," and they promptly did so. The State Health Officer thought it advisable to concentrate the sick and (of course) to vaccinate those who had been exposed, but when he attempted to do this, to remove the patients to the pest house, the Mexicans *resisted.* The State Health Officer then called for a detachment of State Rangers—mounted State police—which was promptly sent him, but the Mexicans shot the captain through the shoulder, knocking the Rangers out. *A squad of United States negro cavalry with a gatling-gun* was then sent to the doctor from Fort Davis, and the "mob" was dispersed (*only* some three or four were killed), and the patients were all taken to the pest house, and all is (reported to be) "lovely"—as far as heard from. The Marine Hospital Service Reports put the mortality from the disease at Laredo, from December 31 to March 3, 1899, at 36 per cent. (72 deaths; 200 cases). We have no report later of the mortality, but at this writing, April 6, there are 175 cases at the pest house.

It is not my intention by any means to reflect on the State Health

Officer. He is a bonded officer, and sworn to execute the law. If the law is bad, it is not his fault, and he is not responsible for it, and it surely is inefficient in many particulars; were it not, the assistance of the United States Army would not be needed; but I raise the question: was Dr. Blunt executing the law in this instance? Where, in the law, is any warrant for forcibly taking an inmate of a man's house to the pest house? If the law warrants such proceeding, and the State is unable to enforce it without the assistance of the United States Army, the sooner that law is repealed, or the sooner the State surrenders all its police powers to the Federal government, the better. If there is authority in law for such proceedings—and I deny it—no man's home is safe from such invasion. But has a *Mexican* any rights which a Texas Governor or State Health Officer is bound to respect? A law that applies to a Mexican citizen should apply to an American citizen. Was any instance, the conditions Dr. Blunt found existing at Laredo among these humble, ignorant and superstitious *citizens* (are they "citizens" of the United States —or, aliens, sojourning temporarily on our shores? If the latter, it is a matter for *international* adjustment) should obtain at San Antonio or Austin or other city; if the *better class* should be the victims of smallpox—would the State Health Officer dare—would the Governor—venture to cause the removal of the sick by force from their homes to a pest house?—Would he dare to so take my child, or yours, to a pest house?

BOSTON MEDIC
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We ask readers of the above to please read elsewhere in this issue the account by Dr. Kenney of his management of a smallpox epidemic in near-by New Mexico. He treated cases where he found them; removed none to a pest house, had no $2,000, and had no need of soldiers to vaccinate the well with buckshot, nor to assist him in vaccinating with lymph. He did *burn a house,* however; but that was not in Texas.

Existing conditions render a recurrence of epidemics of smallpox in Texas imminent at all times. The disease is endemic in Mexico the year around. The great mass of Mexicans—priest ridden for centuries—are opposed to vaccination; they cling to the old superstitious belief that smallpox is a "visitation" sent upon them for their sins, and that it is sinful to try to prevent it. Dr. Yandell, quarantine officer at El Paso, who has been much among the Mexican laboring and vagabond classes, informs me that families will carry their children miles purposely to expose them to smallpox, that they may "have it and be done with it."

If they survive, they are safe in after life, and if they die, it is the "will of God." The river being fordable almost anywhere, there is always a free commingling of these classes with their kind on the Texas side; hence, so long as Texas "sanitation" is content to deal with effects, and to ignorce causes, so long will this great danger and expense continue.

Smallpox is preventable. No fact in medical science is more firmly established; no fact has ever been more clearly and oftener demonstrated than that vaccination will prevent smallpox. I am under the impression, in fact, I am quite sure the United States immigration laws prohibit the immigration of foreigners who are not protected by vaccination; and no immigrant is permitted to land, at Castle Garden, at least, who has not been vaccinated; if such should arrive, the Port Health Officer promptly vaccinates him. Why not apply this rule to Mexicans?

In short, would it not be wiser—more rational, more economical, more humane—more in keeping with an (alleged) advanaced civilization, to *make vaccination compulsory* throughout Texas—make it a condition to even temporary residence in any part of the State, than to be constantly exposed to such danger of outbreaks of the disease as exists at present, and to be forced to resort to such brutal and barbarous methods of dealing with smallpox as those practised at Laredo?

We surely are a primitive people in Texas.—Texas Medical Journal.

THE CAMPS OF CONCENTRATION in the United States during the recent war signally demonstrated the greater dependence of disease upon neglected local conditions than upon climate. Of the total number, 6,209 deaths, reported at the end of the war, 45 occurred in Honolulu, 287 in Porto Rico, 606 in the Philippines, 1,399 in Cuba and 3,872 in the camps of concentration in the United States. Typhoid fever and other intestinal diseases traceable to befouled water and filthy soil roundabout were the chief causes of mortality, and upon this knowledge it was suggested by some army officers and others that the Government should establish and maintain a number of permanent sanitary camps in various sections of the country, such camps to be properly sewered and provided with pure water, and kept in condition for occupancy at a moment's notice, in anticipation of future emergencies.

JEFFERSON AND VACCINATION.

By G. W. DRAKE, M. D., Hollins, Va.

Recently Professor of Physiology, etc., Chattanooga (Tenn.) Medical College, etc.

Had Thomas Jefferson lived until the second of this month, he would be 156 years old; but he died July 4, 1826, during the second year of the administration of President John Quincy Adams. He was one of the greatest statesmen, most accurate observers, and most philosophical thinkers that the world has ever produced.

The reason for the preparation of this paper on vaccination while the name of Jefferson is so prominently before the American people will become apparent when it is read.

That cow-pox protects the human body against smallpox, no sane man to-day doubts, who has investigated the subject.

Another fact is equally universal in its acceptance, and that is the wisdom of not waiting for an outbreak of smallpox in the community before procuring vaccination. Consequently, almost every man, woman and child, in all the civilized countries of the world, has been vaccinated, and smallpox, once the scourge of nations, has lost its terrors. It was our own Franklin that discovered the method by which the dangers of lightning may be averted, and our mother England's Jenner that robbed smallpox of its horrors.

To show America's appreciation of the discovery of this great Englishman, Mr. Jenner was unanimously elected a member of the American Academy of Arts and Sciences, of which John Quincy Adams was Corresponding Secretary. In the letter of Mr. Adams, enclosing the certificate of election, dated Boston, July 13, 1802, occur these words:

"In transmitting this testimonial of respect from my countrymen, I am sure of expressing their sentiments when I add that never, since the institution of this Society, have its members enjoyed a more genuine and universal satisfaction, by the accession of a new associate, than when they acquired the privilege of reckoning among their number the name of Dr. Jenner."

"I am, very respectfully, sir, your very humble and obedient servant, JOHN QUINCY ADAMS,

"Cor. Sec. to the Academy of Arts and Sciences."

In these times, when we are recalling the words of wisdom of Thomas Jefferson on questions of State policy, let it be remembered that the great political reformer was among the first to endorse Jenner's wonderful medical discovery. With vaccine matter obtained from Dr. Benjamin Waterhouse, Professor of the Theory and Practice of Physic in the University of Cambridge, Mass., Jefferson, with his son-in-law, vaccinated nearly two hundred persons in their own families and those of their neighbors. This was the beginning of vaccination in the South, and it was largely through the influence of the sage of Monticello that vaccination was so readily introduced into all the States.

It may be interesting here to introduce a letter from Mr. Jefferson to Dr. Jenner:

"MONTICELLO, VA., May 14, 1806.

"Sir—I have received the copy of the evidence at large respecting the discovery of the vaccine inoculation which you have been pleased to send me, and for which I return you my thanks. Having been one of the early converts of this part of the globe to its efficacy, I took an early part in recommending it to my countrymen. I avail myself of this occasion to render you my portion of the tribute and gratitude due to you from the whole human family. Medicine has never before produced any single improvement of such utility. Harvey's discovery of the circulation of the blood was a beautiful addition to our knowledge of the ancient economy; but on a review of the practice of medicine before and since that epoch, I do not see any great amelioration which has been derived from that discovery. *You* have erased from the calendar of human afflictions one of its *greatest.* Yours is the comfortable reflection that mankind can never forget that you have lived; future nations will know by *history* only that the loathsome smallpox has existed, and by you has been extirpated.

"Accept the most fervent wishes for your health and happiness, and assurances of the greatest respect and consideration.

"TH. JEFFERSON."

Jefferson as a vaccinator should not be forgotten while we remember Jefferson as a statesman. Bryan can surely drink with Belmont a cup of Monticello wine in remembrance of Jefferson the vaccinator without doing violence to his conscience.

The importance of consulting the regular medical profession in medical matters was recently illustrated in the Pennsylvania Legislature. "To medical men belong medical matters," is a

maxim which our legislators would do well to remember. A bill to abolish the compulsory vaccination of children entering the public schools was attempted to be adroitly hurried through the Legislature by a lawyer, a layman, and two ignorant physicians —one a graduate of a defunct eclectic medical college of Philadelphia, and the other a graduate of the Homœopathic College of Baltimore. By strenuous efforts of a few determined opponents, a final hearing was postponed until March 14. At this hearing, distinguished medical men of Philadelphia appeared on the floor of the house and were allowed a division of time with the advocates of the anti-vaccination bill.

After speeches by Drs. John K. Mitchell, Wm. M. Welsh, James C. Wilson, and other eminent physicians, the medical committee was assured by the legislative committee that there was no need of fear of further difficulties at this time, as the introducers of the bill made so feeble a showing that they offered no testimony of a convincing character whatsoever. "Indeed, it seemed to be," says Dr. J. Madison Taylor, "a needlessly powerful array of scientific opinion and medical experience against a pitiably feeble effort of a few misguided men who obviously had not studied the matter fully."

In the year 1884, the writer was chosen by the city of Chattanooga, and by the county of Hamilton, Tenn., to stamp out smallpox, which was threatening to spread over the entire city and county.

By means of compulsory vaccination of all the well (not showing an approved scar), forcible isolation (in a pest house) of the sick, detention (by a guard) who had incurred the possibility of infection until the time for the onset of the disease had passed, thorough disinfection of rooms, furniture, and clothing, by sulphur fumigation, followed by soaking or swabbing with sublimate solution—1 to 1000—the smallpox in Chattanooga and vicinity was, in a comparatively short time, stamped out effectually.

His experience in the management of this outbreak enabled the writer to add his testimony to that of all scientific observers in favor of vaccination as the prime preventive procedure against smallpox.

Vaccination is a public duty, and its neglect a crime against humanity.

The writer would especially recommend glycerinated vaccine, put up in sealed glass tubes, as the safest and most reliable form devised for the preservation of the matter.

Thomas Jefferson was the discoverer of the most reliable method of preserving vaccine virus in his day. He directed that it be put in a small vial, well corked, and this vial be put in another larger, filled with water.

EVOLUTION.

From The Chicago "Standard."

"A scientist announces that the human race is an evolution from the vegetable."—Daily Paper.

If this be true, as Science tells, 'tis very plain to see
In certain folk the influence of marked heredity.
Who can deny, if he shall try to reason out their heads,
The dads of many a festive dude once dwelt in cabbage-beds?

And then what cannibals they are down East in Boston town,
Who eat their own relations cooked and served with bread that's brown!
For no one with a knowledge of the facts behind the scenes
Disputes that they of Boston are descended all from beans.

And, oh, the politician! How he shows his ancestry
In every secret deal he makes that knows no honesty!
Just watch him as he walks along so proudly on the street,
And say if there are lacking signs that he's a perfect beet!

The lover, too, so soft-eyed, with the ways of turtle-doves,
Whom all the world smiles sweetly on, whom everybody loves—
'Tis clear that he's the offspring of that sweet and unabashed
Original potato that in ancient days was mashed.

But you, O Phyllis darling, I cannot believe that you
Were ever in the garden patch where such plain things grew;
Your fathers were not veg'tables, for everybody knows
That you're the fair descendant of some sweet and blooming rose

MEDICAL EXCERPT.

By T. P. Corbally, A. M., M. D.

Galvanizing the Brain.—M. Leduc, of Nantes, presented a report ("Gazette Hebdomadaire," April 23d) on "La Galvanisation Cérébrale" to the Société Française d'Electrotherapie. The brain, he says, bears the application of the galvanic current perfectly well if the electrodes employed are of large surface, and the currents should be applied as follows: The positive should be applied on the back or over the epigastrium and the negative to the head, better immediately over the forehead.

From the application of the current, effects are observed analogous to those produced in similar applications to the nerves of motion and of sensation.

Negative galvanization gives rise to an increase in the cerebral activity; positive galvanization produces a diminution of cerebral activity. The regular and constant action of the negative current is to dispel the effects of intellectual fatigue; it removes cerebral exhaustion, renders the mind more clear and intellectual work more easy.

There is no doubt that galvanism, carefully and judiciously applied, has its advantages in nearly all forms of cerebral disease, but very serious results may follow its injudicious application.

Hydatic Cysts.—M. le Professeur Dieulafoy sent a communication to l'Académie de Médicine, recently, on the treatment of hydatic cysts of the liver, as illustrated by two cases which he had lately treated: one of them, a suppurating cyst which was cured by laparotomy—the other, a hydatic cyst also, was cured by puncture. Each of these methods has its application and it was on this point that the writer dwelt at some length.

Puncture has been successful, but it is not free from danger. The professor related a number of cases in which death followed in a few minutes after the operation. He believes that in such cases the puncture is not the cause of death, but the penetration into the peritoneal cavity of a quantity of the cystic fluid.

It follows, he says, from the experiments of MM. Debave and Achard that this liquid is extremely toxic for the system. It is necessary, therefore, to take every precaution when puncture is employed to prevent the smallest particle of the cystic fluid from filtering into the peritoneal cavity. For this reason extreme care

should be taken to evacuate every particle of the liquid contained in the cyst, and not to remain satisfied with removing a part of the fluid, however great, as has generally been done in the cases in which death followed the operation. Besides, great care should be taken to use a very fine needle, which should always be left in place after it has been introduced into the cyst, and should not even be disturbed.

If possibly the flow should be stopped the cyst should be punctured with another needle without in any way disturbing the first, and both needles should be removed at the same time when the liquid has ceased to flow. No cyst should be punctured except those of recent formation and those in which adhesions have not taken place.

Laparotomy should always be preferred to puncture in old cysts when adhesions have taken place and especially when suppuration is found to exist.

THE NEW MEANS OF DIAGNOSIS OF DISEASE.—Two fields, at least, of explanation made possible by the fluorescence of vacuum tubes, have been recently entered, and give promise of noteworthy results. One of these is the examination of lung tissue in the case of consumption—the healthy lung gives comparatively little shadow in the sciograph, while the diseased tissue has a much darker appearance in the picture, and thus it is possible to ascertain exactly the part affected and to attempt palliative or remedial treatment accordingly.

The other recent use of this discovery, regarded as especially valuable by the medical profession, is that of observing the movements of the stomach and its contents in the preliminary digestive process. By mixing subnitrate of bismuth, which is said to be a harmless powder, with the food, the movements of the stomach may be seen by means of the fluoroscope, under certain conditions.

Further, when a focus tube is placed behind a person, so that the rays pass through the thorax, the bones are very clearly depicted, while the heart is seen as a definite shadow in contradistinction to the light area around. This light area is occupied by the lungs, which are not dense enough to stop the rays, but allow them to pass through and give rise to a fluorescence on the screen, and though the shadow of the heart is not of a uniform degree of intensity, being lighter at the margins than toward the centre, the outline can be clearly seen, and its pulsating movements detected.

TREATMENT OF INSANE IN BELGIUM.—Consul Winslow writes from Liege, March 8, 1899, in regard to the system of caring

the insane in Belgium, which, he says, is original with that country. The patients are placed in quiet villages and are cared for in the homes of the citizens, who receive 27 cents per day for the food, clothing, and care of each patient. Only the harmless insane are admitted to these colonies, and a medical director has charge of each. There is also an infirmary for the sick. The patient is allowed all possible liberties, and is made to feel that he belongs to the family in which he resides. In one colony in the province of Liege 15 per cent. of the afflicted have been entirely cured by this treatment and the condition of others much improved.—Consular Reports, No. 225.

DEATH FROM HEADACHE POWDERS.—Three deaths from the taking of headache powders having occurred recently in Allegheny County, Pa., the coroner's jury on the last case recommended that precautionary notices be printed on all such preparations containing coal-tar products and that a State law be enacted to enforce this regulation. In the absence of such a law, druggists were urged to warn patrons as to the danger of using powders of this sort. It would be well besides if the ingredients of such preparations were printed conspicuously on some part of the wrappers in which they were contained, and still better if their sale was prohibited on the prescription of a physician.

QUEER DISEASES, QUEER CURES.—This is a day of queer diseases and queerer cures, observes the New York "Sun," and we are inclined to agree with our shrewd contemporary. A case of nervous exhaustion, dyspepsia or rheumatism can give one a long lifetime of interesting and varied experiences. One may lounge among the vineyards of Southern France and eat unheard-of quantities of grapes in the name of medical science. One can take the open-air cure in the Tyrol, where the patients, clad simply and sufficiently in one thin, abbreviated tunic, ramble over the hills, or, minus the tunic, lie on the grass and soak up sunshine. There is the koumyss cure on the Russian steppes and the starvation cure in Germany. Germany is the native heath of the barefoot fraternity, too, where devout believers in Father Kneipp paddle merrily about in the morning dew, and, arrayed in conventional purple and fine linen, but still barefoot, invade the neighboring towns on Sunday.

Malta's way of treating rheumatism is a trifle heroic, but a generation brought up on mustard plasters and electricity ought not to object to it. The patient is stripped and bees are cordially invited to settle upon his body. It amuses the bees and cures the rheumatism, so it seems to be a philanthropic system all around. The

poison in the bee sting is said to neutralize the acid in the blood which is responsible for the rheumatism.

There are wonderful stories afloat about the cures effected by Dr. Gruby (Heine's physician), though the medical fraternity decried him as a charlatan. His method was the simplest in the world. Instead of giving his patients a list of things which they were forbidden to eat, he gave them a menu of the things which they might partake of, with small changes in that diet.

He exercised a sort of mysterious influence upon his patients. He did not write out the prescriptions himself, but dictated them to his patients. Nor did he permit any contradiction. "You need not write down what I dictate, but in that case you must not send for me." To a lazy man suffering from dyspepsia he gave the order "to eat an apple every morning under the Arc de Triomphe," or to drink a certain sort of Malaga wine which he was to purchase himself, a bottle at a time, at a certain store.

The man needed exercise, and he thus compelled him to take it. To a certain deputy he gave the advice, as the only means to save his life, to take several times a week the meat of an ibis. It meant that the deputy in question must take a trip to Egypt, and to spend his time in going ibis shooting, thus enjoying the benefit of the Egyptian climate and the attendant exercise of the hunt. An artist had nervous twitching on his arm. The doctor prescribed the sewing up of his pockets. The arm had by this order to hang down and was kept in motion, which cured the weakness of the muscles, restoring the patient fully.

"The Alma"—A Change in the Management.—Dr. Elmore S. Pettyjohn, for the past six years medical director of "The Alma," has leased that institution on his own responsibility and assumed control May 1. The doctor received his medical degree at Rush Medical College, graduating in 1882, and after spending a decade in institutional and private practice, was called in 1893 to take charge of "The Alma," which has since developed into a sanitarium representing an investment of $300,000, and is thoroughly equipped for the treatment of medical and surgical cases. The popularity achieved by "The Alma" among the profession in recent years is attributable to the high ethical plane upon which it has been conducted by the guidance of Doctor Pettyjohn, and under the absolute management of this experienced physician, reinforced by a staff of eminent medical consultants, the sanitarium should henceforth attain still greater celebrity as a health resort.

EDITOR'S TABLE.

SANITARIAN, JULY, 1899.

☞ All correspondence and exchanges, and all publications for review, should be addressed to the Editor, Dr. A. N. Bell, Brooklyn, N. Y.

MILK DISTRIBUTION IN THE PUBLIC PARKS—LETTER FROM NATHAN STRAUS.

The delay on the part of the Board of Estimate in granting the Department of Parks a transfer of money with which to erect milk distribution booths in the public parks has prompted Nathan Straus to address the following letter to Mayor Van Wyck:

"New York, May 31, 1899.

"Dear Mr. Mayor—Some reported remarks of yours at the last meeting of the Board of Apportionment suggest a misapprehension on your part in regard to the character of the service to be rendered by the aid of the milk booths which it is proposed to erect in the parks. I therefore take the liberty of explaining the nature of the public work to which I propose to make these park booths auxiliary.

"I have been a Park Commissioner, and need hardly say that no man can have a more scrupulous regard than I for preserving the parks against any kind of defacement or perversion of their true purpose. But I think you will agree with me that one of the most desirable uses to which the parks can be put is to serve as breathing places and recreation grounds for the people of this city, and that whatever tends to increase their value in this respect, without lessening it in others, must necessarily be desirable. Your Honor is doubtless aware that the ravages wrought by death during the hot months of the year in the ranks of the children of New York are comparable only to those of a pestilence. For thousands of mothers seeking for their sick babies the reviving influence of fresh air, the parks furnish the principal of the accessible health resorts. But for such a purpose half their value must be lost if the mother cannot readily secure a supply of the nutriment suited for an ailing child. The privilege we have heretofore enjoyed of supplying milk in the natural and sterilized state by the glass in the parks has not included such facilities for the preservation of infants' food as the new booths would provide.

"It is to dispense this food under proper conditions and at a

nominal price, or to the needy without price, that the proposed booths are chiefly required. I regard them not only as a proper but a virtually essential part of the equipment of parks intended for the benefit of the people. I submit that in furnishing pasteurized food for children taken to the parks to escape the blighting influence of our heated term I am not only saving the lives and improving the physique of the population growing up in the city, but I am lessening the burden the municipality assumes in providing hospitals and other forms of charitable relief for these people and their offspring.

"I may be pardoned for recalling the fact that the distribution of pasteurized milk foods throughout my various depots has made an impression which can be clearly traced from year to year on the infant mortality of New York. In the last five years there has been a reduction of 15 per cent. in the deaths of children in the present boroughs of Manhattan and the Bronx, and much of this is directly and demonstrably due to the use of the sterilized milk foods dispensed at my depots. I need hardly say that since I first undertook this work the education of the people into the necessity of using for children's food milk from which all noxious organisms had been removed formed an important part of the enterprise. The opportunity for the education which would be furnished by the booths which it is proposed to erect in the parks would be of invaluable service in my work, and of corresponding benefit to those in whose behalf it is undertaken. With the facilities which these booths would offer for the keeping of infants' food in proper condition, I am thoroughly convinced that I could make a further marked diminution of the death rate among the children of New York City.

"If more absolute demonstration were needed of the saving of infant life effected by the sterilized milk food, your Honor may find it in the experience of the pasteurizing plant installed in the city nursery on Randall's Island for the treatment of the milk supply of that institution. Impressed with the enormous death rate prevalent there a few years ago, I proposed to the then Commissioners to counteract it by providing, at my own expense, for the elimination of the element of contagion from the children's food. My offer was declined, but some measures of partial improvement were adopted, which, while lowering the death rate, still left it at a figure abnormally high. At the beginning of your Honor's administration I found the new president of the Department of Charities, Mr. John W. Keller, in hearty accord with me

as to the nature of the remedy needed to reduce the death rate in the city nursery. With his earnest and active co-operation the pasteurizing process was applied to the milk supply, with the result that the infant mortality was reduced from 528 out of 1,179 treated in 1897 to 256 out of 1,284 treated in 1898. In other words, the death rate was reduced from 44.44 per cent. to 19.86 per cent.

"In view of such facts, it appears to me that no possible means should be left untried to place pasteurized milk foods within the reach of those whose children often fall a sacrifice to the want of it. The law would mete out its earnest punishment to the deliberate murderer of any one of these little ones, but is not a denial to them of the means of fighting off death an offense of only less magnitude? I am sure it is one which would be visited by your Honor's most severe reprobation, and in this conviction I confidently wait your approval of the step proposed by the Park Board, so clearly justified by every dictate of humanity and public policy. I am yours respectfully, NATHAN STRAUS."

TO SECURE PURE MILK DELIVERY IN BOSTON the Board of Health has had a census of New England cows taken; the cow stables and their conditions examined by competent inspectors, and adopted a resolution to prohibit the delivery of any milk in Boston except by license of the board. Thus far (June 1) licenses have been issued to 391 milk pedlers, who have complied with all the requirements, while a number have been withheld pending charges in milk rooms, such as trapping ice chests, building tight partitions, etc. Permits have been issued to the owners of 1,473 shops. Before a permit is granted, the premises are examined to determine that the sanitary conditions are good. A large number of applications have been rejected, and the unsuccessful applicants have been notified not to continue to sell. The rejections have been caused by absence of ice chests, use of shops as sleeping rooms, presence of water closets, and, in not a few instances, particularly in the North and West Ends, general conditions of filth.

All milk produced in the city of Boston for sale is required to be strained, cooled or stored as soon as it is drawn from the cow. The board also forbids milk dealers using in any way a milk vessel for any other substance than milk, and any person violating this regulation will be liable to forfeiture of license. Every person engaged in the production, storage, transportation, sale, delivery or distribution of milk is required to immediately on the occurrence of any case or cases of infectious disease in his family, or

among his employees, or within the building or premises where milk is stored, sold or distributed, notify the Board of Health, and at the same time suspend the sale and distribution of milk until authorized to resume the same by the Board of Health.

BACILLI IN TELEPHONES HARMLESS.—Report of Dr. H. W. Hill, director of the Biological Laboratory of Boston Board of Health, June 10, shows, after diligent examination of a number of telephones in public buildings and at public stations, with few exceptions, no growth of any kind resulting from their use. Three yielded in culture only the hay bacillus from both the insides and outsides of the transmitters, a harmless and widely distributed form, very common in dust. Continuing, the report shows how it is possible, nevertheless, that infectious diseases, particularly diphtheria, tuberculosis and syphilis, may be conveyed from one user of the telephone to a subsequent user, and recommends the use of a liquid disinfectant. Dr. Hill suggests further than the receiver, or earpiece of the telephone, might also receive cleaning and disinfection, as that would afford some sense of security not otherwise obtainable.

WATER FOR BROOKLYN.

"Short of water" has been the common cry of the Brooklyn water works engineers for several years; and it is vehement this summer, as usual, notwithstanding THE SANITARIAN'S contention that the supply is exhaustless with proper means to utilize it, and these now seem to be offered:

From the "Brooklyn Eagle," May 25, 1899.

Jamaica, L. I., May 25.—The contracts between the Jamaica Water Supply Company and the Town of Jamaica have been approved and confirmed by the city authorities, and the company has recently extended its mains through Hollis and Queens. It is now pumping daily three millions of gallons of water, which is pronounced by the city's experts to be of excellent quality. An offer has been made to supply the borough of Brooklyn with ten million gallons on short notice from its present system of works with a slight enlargement of its pumping station. President Lockwood of the Jamaica Water Works is also president of a company in the Town of Islip and has made a thorough examination of the various water strata on Long Island, and when asked as to the water resources of the island he said:

"I will put up a sufficient bond to furnish the City of New York with two hundred millions of gallons of pure water daily from Queens and Nassau counties, the territory already said to have been drained by the Brooklyn Water Works, which only furnishes the city with about eighty-five millions of gallons of water daily. I will do it in a reasonably short time after the contract is awarded. I would not spend my time in pumping along the south side of Long Island, where, after the water is pumped to a low level, salt water filters in and prevents further pumping. I am satisfied that there is an almost inexhaustible supply of remarkably pure water under the plains of Long Island, and I have examined every section fully enough to know where to get it. Moreover, I will deliver the water entirely under cover to the Ridgewood reservoir or any other desired point, and there will be no decaying animal or vegetable matter allowed to enter it before its delivery to the city."

Mr. Lockwood says that he has made a formal offer to furnish the city with ten millions of gallons daily at once and at a price as low as that paid by the city for the maintenance, operation and interest on the cost of its own plant.

NEW ORLEANS AND YELLOW FEVER.

Referring to the single case of yellow fever in New Orleans, May 30, the Nashville (Tennessee) "Banner" of June 2 takes occasion to remark upon the "order of the health authorities of Texas prohibiting the entry into that State of any freight or passengers from New Orleans. This is in disregard of the interstate agreement that quarantine should not be declared on the report of a single case of yellow fever, evidences of an epidemic alone warranting such a procedure. The Louisiana State Board of Health discharged its part of the agreement in giving prompt notification to the health authorities of the adjacent States of the appearance of a suspicious case, and this frank and timely discharge of duty was met by an arbitrary order on the part of the Texas officials which unsettles commercial relations between the two States.

"The incident furnishes another proof of the disadvantages of State quarantine regulations. The matter is one closely allied to interstate commerce and can be properly regulated only by the national government. A survival of old State sovereignty prejudice has led some prominent Southern men to stand in the way of the South's interest by opposing national quarantine. This spirit interfered with the passage of the Caffery quarantine bill at the last session of Congress, and if there is a return of yellow fever to the

country this year there will be a repetition of the shotgun quarantine panics that have been so demoralizing in the past. A national quarantine system is clearly needed."

About the case of yellow fever, there seems to be no question of its local origin. And it was not as the newspapers allege "sporadic"—a word much more commonly used many years ago than it now is, with reference to diseases of apparently spontaneous origin neither epidemic nor endemic. But the case was of unquestionable *spore*-radic origin notwithstanding the severity of the past winter, upon which so much reliance was placed for the destruction of yellow fever germs. And this gives us occasion to recall attention to our remarks on the viability of disease germs in the soil three months ago, with special reference to the danger which, according to newspaper reports, New Orleans has wilfully incurred in turning up the soil.

"To turn up infected soil for sewerage, or for any other purpose, during hot weather is a well recognized danger in New Orleans, as in other localities; because disease germs are well known to *live,* if not indeed to multiply, outside of the living body, in congenial soil, as well as within it. When people generally recognize this fact, especially with reference to yellow fever, and act upon it, they will the better appreciate how and *when* they may safely proceed to deal with such germs." (SANITARIAN, April number, p. 357.)

But we were evidently mistaken with regard to what we supposed to be a well recognized danger by the people of New Orleans, else their confidence in the deadliness of the frosty weather of the past winter on the disease germs was so great as to wholly divest their minds of the possibility of any remaining vitality in them. At any rate it appears that at a meeting of the city Board of Health, May 1, "it was the sense of the board that the work of continuing excavations for drainage work during the summer could be continued without the least jeopardy to the public health, and the National Contracting Company was accordingly authorized to proceed with the work, subject, however, to such sanitary regulations and restrictions as the board may see fit to adopt." What the restrictions of the board have been, if any were imposed, we have no knowledge of.

"Many years ago," Health Officer Kohnke remarked ("Times-Democrat," May 2), "when this city was visited almost annually by yellow fever and occasionally, if not frequently, by cholera, and later when malaria was much more virulent and general than it is

now, the theory was advanced that upheaval of the soil caused an increase of those diseases. Some sanitarians believed even that the soil upheaval originated yellow fever.

"In those days there was no such thing as scientific quarantine and no system of maritime sanitation worthy of the name. Outside sources of infection could not be excluded and the germ theory of yellow fever was not yet formulated as we understand it to-day.

"With the advent of maritime sanitation and scientific quarantine the theory of the telluric origin of yellow fever lost ground; and a long continuance of freedom from yellow fever during a period marked by extensive upheaval of earth in summer destroyed the last vestige of belief that the disease was indigenous to our soil."

In view of what is now *known* of the habitat and viability of disease germs in filthy soil and the recorded facts of the frequent rise of yellow fever and malarial fever, and recently of plague consequent upon the upturning of such soil, the above quotation is, to say the least, remarkable. That the case of yellow fever above referred to arose from domiciliary germs ensconced in material that was not frozen last winter, and not from the freshly upturned soil, is highly probable. But that does not in the least detract from the more widespread danger in the progress of the excavation work—if indeed the work is still in progress. The SANITARIAN sincerely hopes it is not: it is dangerous for New Orleans during summer weather.

That the *sewerage* of New Orleans has been determined upon by the taxpayers, and now only awaits legislative formalization of the procedure and the season for proceeding with the work, is the most important undertaking in the history of the city.

HEALTH IN HAVANA.

Havana, June 10.—The army health report for the City of Havana is very gratifying to General Ludlow. Of the 2,000 men or more, less than 2 per cent. is sick. This is a better average than is usual anywhere in the United States. Among the troops there are a very few cases of sickness, these being mainly persons who are suffering from typhoid fever, of which there are four cases. The ordinary health of the city remains good.

One supposed case of yellow fever is reported on board the steamer Ardan Mohr, from Carthagena. Some of the army officers say the patient is suffering from yellow fever, but Dr. V. T.

Brunner, chief quarantine officer, declares that he is not. The ship has been quarantined and the man removed to the hospital. He was taken sick before the steamer arrived at Havana. In future vessels arriving from Carthagena will be obliged to undergo a temporary quarantine.

Jose Maria Gomez, Governor of Santa Clara, telegraphs to Senor Domingo Menez Capote, secretary of government in General Brooke's advisory cabinet, that the rural guard at Yaguargay has captured three Spanish guerillas, Sanilla Sanchez, Leon Perera and Juan Prado, who have terrorized the inhabitants of that vicinity of late.

Advices from Sagua say that Captain Rafferty is paying the soldiers amid great enthusiasm. Many of the troops are anxious to receive the money, as they are suffering for lack of implements to begin the cultivation of the land and earn sufficient money to begin purchasing necessities.

The total number of arms delivered up in Matanzas comprises 17 rifles, 5 carbines and 1 Remington.

At 3 P. M. the temperature in Havana was 80 degrees Fahrenheit.

SOME DISTRESSED CUBANS.—A Havana correspondent of the New Orleans "Times-Democrat" makes light of a matter which he says has been seriously taken up by the people there, the complaint of the undertakers, who at a meeting of their association some days ago passed resolutions condemning the American intervention, as it almost annihilated their business, as the deaths have decreased. No doubt the doctors and druggists will complain next that people don't get sick.

HEALTH OF MANILA.

"I wish to refute the statements generally circulated in regard to the health and climate of the Philippine Islands. Being within the Tropics, they of course lack the invigorating effects of frost, and the temperature averages high—at Manila, about 78.3 deg. F.: but extremes are not wide apart, and during the last year I heard of no temperature below 57 deg. F. in the islands, and none below the sixties in Manila. Mercury in the shade rarely rises above 85 deg., nor above 95 deg. in the sun.

"Being on the coast of a bay so large as to be almost an inland sea, and having eight miles to the east a lake with 100 miles of shore, whose waters seek the bay through the large and rapid

Pasig, the city of Manila has fresh air constantly, as well as sea breezes.

"The sewers of Manila are not good and can never be first class, because of its low level; but the rainfall here is above 10 feet per annum and quite evenly distributed, so that the streets are rain swept and the sewers well flushed almost every day. There is also an advantage in hot, wet weather, which hastens the decay of vegetable or animal matter, this soon rotting and being washed away.

"The city water supply is abundant. The water is carried in large iron pipes about seven miles from springs, and is exceptionally pure and agreeable to taste. I use it every day as a beverage, and have never experienced ill effects therefrom. I have not been sick a minute since I left the United States in 1897.

"In filthy quarters, smallpox may be found almost any day; but few deaths result, and the sanitary measures of the present government have been of benefit. The death rate is small, and it is only necessary to live properly to be entirely healthy."

O. F. WILLIAMS, *Consul.*

MANILA, February 24, 1899.

Andre Bellesort's "A WEEK IN THE PHILIPPINES," which "The Living Age" has translated from the "Revue des Deux Mondes," is the more interesting because this sprightly Frenchman saw the islands in November, 1897, before they had assumed any interest to Americans, but while the Filipino insurrection against Spain was in progress. He writes of them graphically and with a Frenchman's characteristic lightness.

MEDICAL DEPARTMENT AT MANILA.

Surgeon-General Sternberg made public on May 13th a report by Major Henry Lippincott, Chief Surgeon at Manila, of the operations of the Medical Department in the Philippines, from Feb. 4th to March 31st. With the former date began a prolonged series of engagements with the Filipinos, and from that time to March 31st, 182 United States soldiers were killed or died from wounds received in action. The number of wounded during this period not included in this number was 847. It is noted that "the effect of the firing was marvellous on the sick," many men who were hardly considered well enough for duty, leaving the hospital for the firing line. The medical staff were prepared for all emergencies. The first-aid packages proved of the greatest possible value. "Litters, pouches and medical and surgical chests were in readi-

ness, easily prepared articles of food, stimulants and water were on hand, and the ambulance company did excellent service." The signal corps, by putting the hospitals in communication with the troops at the front, made it possible to send supplies at a moment's notice. The hospitals were supplied with an abundance of everything essential, "which was simply astonishing when the great distance from the United States was taken into consideration." The Corregidor Hospital, which is used for convalescents, has been of great benefit. Cases of typhoid and malaria have done well there, but patients suffering from dysentery and diarrhœa, though improved, have rarely been cured. Rheumatism is obstinate in the climate of the Philippines. The total number of cases of smallpox up to March 31st was 151; deaths 77. There were 85 cases of varioloid with no deaths. There is "every reason to hope for a cessation of smallpox." The food supply has been good. Two hundred and fifty-six wounded Filipinos, among whom were four women, were received into the hospital up to March 31st. Of these forty-five, including one woman, died. "These people receive the best of care and treatment and seem to appreciate the efforts made in their behalf." Among the Filipino wounded suppuration is the rule, whereas, among our soldiers it is the exception. Many causes account for the condition in the former, the chief being infection before coming into the hands of our surgeons. They have, moreover, an inordinate propensity to tear off dressings and finger their wounds when opportunity offers.

INCREASED VACCINATION IN ENGLAND.

On the occasion of a recent dinner in London the president of the Local Government Board made an interesting announcement relative to the effect of the new Vaccination Act. He stated that from information just received it appeared that the Vaccination Act was going to have a precisely opposite effect to that which had been expected of it. The head of his medical department had written him that day: "I have requested that any general information as to either increase or decrease in the number of children vaccinated this year as compared with the corresponding period of last year may be noted by the inspectors of the board who inspect the work of public vaccination. As yet I have not received a single account of any decrease. On the other hand, the inspectors inform me that there is distinct evidence of a general increase in the amount of vaccination going on, and in a number of cases the actual statistics recorded are highly satisfactory in this respect. In

several such instances the increase in the number of certificates of successful vaccination sent in has ranged from 25 to 100 per cent." The increase was attributed by this gentleman to the system of domiciliary vaccination, and the provision of a better and purer kind of lymph, which had relieved the apprehensions of a great many people who were formerly opposed to vaccination.

WOMEN SANITARY INSPECTORS.

Four women have been appointed as sanitary inspectors in Birmingham, England. It will be the work of these women to penetrate into the worst slums of Birmingham and, as the report says, to speak to the mothers on such subjects as the cleaning of the house, the ventilation of the rooms, the destruction of refuse, and the care of their children. Especially do the committee feel that instruction of mothers as to the feeding and care of their infants will bear fruit in the reduction of the high infantile death rate of these districts.

The Birmingham Health Committee have only followed the example of a number of other towns in Great Britain. Glasgow has now six women sanitary inspectors employed by the corporation, Liverpool has five, Chesterfield has one (paid by a voluntary society), and Manchester and Salford together have sixteen. Of this last number, nine are paid by the corporation, and seven by the Ladies' Health Society, which with astonishing energy initiated the movement, and has now the pleasure of seeing its paid visitors become the servants of the corporation.

The system at work in Manchester is somewhat peculiar. The poorer parts are mapped out into sixteen districts, together with six in Salford. Each district has a superintendent and a paid visitor. The superintendent has oversight, the visitor acts under her direction, and the excellent results proceed from this combination of tact, foresight and energy. The visitor "lends a hand" in nursing a patient, tending a fractious, improperly-fed infant, cleaning where the case demands it, and giving sensible advice at all times. Carbolic soap is sold at low rates, whitewash brushes and pails are lent, leaflets on children's maladies and the necessity for cleanliness are distributed and explained. Under these circumstances, the visitor is regarded, not as a fault-finder, but as a friend and helper. It is the proud boast of one visitor that she has sold fifty blocks of wood for placing under the window sashes and affording ventilation with the minimum of draught. Such health

visitors are also able to report to the sanitary inspectors cases where serious nuisances are found to exist.

BOTTLES CONTAINING POISON.

In view of the many and distressing accidents that have resulted from stupidity and carelessness in the use of poisons, the use of a distinctive box or bottle for these lethal mixtures is imperative. The Brooklyn "Eagle" says that a sensible proposition has been made by Howard Egleston, of this city. It is that bottles containing poison shall be three-cornered. It is as easy to make bottles of this shape as square or oval or round, and there would be no mistaking a bottle of this character in the dark. It is not necessary to make a law on this matter, for laws could not enforce any more than the original bottling, but it would be well if druggists would agree to use these vessels instead of marking, as they do now, corrosive sublimate and all that kind of thing with a paper label bearing a pictured skull and cross-bones. These labels are nearly useless, since a few drops of hot water will remove them. Most of the poisoning that has been done by accident has resulted from the mistaking of bottles in the dark. The "Eagle" adds:

"In a recent case a mother gave carbolic acid to her child instead of cough medicine, because she did not use the sense or caution that a person would commonly exercise when he made sure that he was putting salt instead of sugar on a potato. Had the bottle been of a distinct shape, the nature of its contents would have been so obvious that a mistake could not have happened. The use of a distinctive bottle makes exceptions all the more dangerous, since people would not look for poisons in bottles of more usual form. But those villains who kill by mail are not restrained by laws and they will continue to deceive their victims by the use of drug bottles for deadly chemicals, unless the police act on the knowledge they pretend to have and discourage that most cowardly and contemptible of murders."

AMERICAN HORSE MEAT IN NORWAY.

Consul Nelson, of Bergen, sends, under date of January 23, 1899, the following translation of an article in the Bergen "Aftenblad":

"A recent edition of an American newspaper contains an article on the horse meat trade in the United States. The article says that there is a large factory of horse meat at which inspectors

rarely, if ever, call, as the firm has given a guaranty not to sell horse meat in any form in the United States.

"It is known, however, that this firm has shipped large quantities of horse meat to Norway, where it is much sought after as a delicacy. This delicacy—to say the least about it—is of a rather doubtful nature; for, according to the newspaper referred to, old horses and mules are used for meat purposes. The meat is cut, salted, packed, and then shipped to Christiania.

"The newspaper officials have tried to find out more about this trade. We know for certain that a large amount of horse meat is imported from America and England. It is cut into pieces, salted a little, and packed in barrels. Large quantities of this meat are used in sausage factories.

"It is impossible to inspect this meat properly or to ascertain whether it comes from sick or 'dead' horses. Then, again, as this meat is cut in small pieces, a barrel can contain both good and bad. In only a few cases are the recommendations of the health authorities obeyed with regard to these 'delicacies.'

"This is evidently a very unjustifiable method of procedure. The best and most natural way would be to forbid the importation of horse meat; but if we do not carry the matter so far, we ought to take some other measure. There should be a health certificate on all kinds of meat, and this should be signed by the Norwegian consul. Furthermore, the meat should not be imported in small pieces and not less than one-half or one-fourth of the animal should be admitted."

A copy of the above was referred to the Department of Agriculture. The Department says, in reply:

"The meat of horses is entitled to the same inspection in this country as that of other animals. If the Government of Norway is suspicious of the character of the horse meat shipped to that country from this, it might require that such meat be accompanied by a certificate of inspection by the officers of this government. In that case, there would be a certainty that the meat was the product of horses in good condition as to health, and that the meat was sound and wholesome at the time it was inspected."—Consular Reports, No. 225.

BUTTER AS A VEHICLE OF THE TUBERCLE BACILLUS.—It seems (New York "Medical Journal") that absolute reliance cannot be placed on past refutations of Obermüller's allegation that the butter found in the markets contains tubercle bacilli as a rule. Dr. L.

Rabbinowitsch ("Deutsche Medicinische Wochenschrift," 1899, No. 1; "Centralblatt für Innere Medicin," May 20th) reports the general freedom of Berlin butter from the bacillus, but says also that all the varieties of butter obtained from a certain large establishment contained the bacilli, together with unusually large numbers of other bacteria. We may infer, therefore, that it is not always the dairyman that is responsible for the contamination.

NUTRITIVE QUALITIES OF ALCOHOL.

Middletown, Conn., June 13.—At a meeting of the Middletown Scientific Association this evening Prof. W. O. Atwater, of Wesleyan University, reported the results of the experiments upon the nutritive effects of alcohol, lately carried out under his direction, upon a man in the respiration calorimeter.

Pure alcohol was administered with water or coffee. The alcohol was taken with an ordinary diet of meat, bread, butter, milk, sugar, and the like. The amount per day was equal to about two and a half ounces of absolute alcohol, about as much as would be contained in five or six ounces or three average glasses of whisky.

Three important results were observed: First, the alcohol was oxidized, i. e., burned as completely as bread, meat, or any other food. Second, in this process all the potential energy of the alcohol was transformed into heat and muscular power. In other words, the body made the same use of the energy of the alcohol as of that of sugar, starch, and other ordinary food materials. Third, the alcohol protected the material of the body from consumption just as effectively as the corresponding amounts of sugar and starch. That is to say, whether the body was at rest or at work, it held its own just as well with the one as with the other.

NEW QUARANTINE COMMISSIONER.—Governor Roosevelt has appointed Mr. Hugh McRoberts, of Tompkinsville, quarantine commissioner, to fill the vacancy caused by the death of Judge Patterson.

SICKNESS AMONG IMMIGRANTS.—During May about forty-five thousand immigrants were landed at this port and two hundred and eighty-five of this number were treated for disease before getting out of the jurisdiction of the medical officers at the Barge Office. The percentage of sick has varied little during the past ten years, being about two-thirds of one per cent.

MUNICIPAL TUBERCULOSIS HOSPITALS.—Governor Roosevelt has signed Assemblyman Henry's bill to allow cities of the first class to establish, equip and maintain outside of their corporate limits, with the approval of the State Board of Health, hospitals for the regular treatment of those afflicted with pulmonary tuberculosis.

ATMOSPHERE OF A CITY.—In a paper contributed to "The Transactions of the British Institute of Preventive Medicine" it is stated that, even in a suburb, the dust particles number some 20,000 per cubic centimetre in the open air and 44,000 in a quiet room; while in the city the totals per cubic centimetre were 500,000 when taken from a roof, 300,000 in a court and about 400,000 in a room; in other words, the air of the square mile is 900 per cent. thicker than in the suburbs, which is in accord with the general experience that fogs are both more dense and more frequent over the centre than in the outskirts. But what is especially interesting in this remarkable paper is the statement that, though dust is the great carrier of micro-organisms there is only one of these per 38,000,000 of dust atoms. This being so, it is calculated that a man could live in the metropolis for seventy years and only absorb some 25,000,000 of microbes into his system from the air, or about the same number as he drinks in half a pint of unboiled milk.

UNCLEAN SODA GLASSES.—If there is danger of communicating disease in many ways (Maryland "Medical Journal"), so often commented on by boards of health, there is certainly a danger in the unwashed soda-water glass and long spoon. The average mixer empties the remains from an unclean glass, gives it a hasty dip into an unseen receptacle containing water long since contaminated and then serves the next customer. Even with ordinary water the practice of using the same glass by many persons is objectionable, but with sticky syrups, oily cream and flavors of all sorts, the chance of getting a clean glass is very small. The long spoons, with hollow handles to be used as straws, are also a curse of the soda-water counter.

HUMAN ODORS.—According to Dr. Bet (Archiv der gesammten Physiologie, "Medical Record,"), every man has his own particular odor, while but few possess a sufficiently keen sense of smell thus to recognize the individual. Dogs, however, possess the power of accurate discrimination. The author has observed

one individual whose powers were marked in this respect under severe test. It is furthermore believed that every family has an odor of its own possessed to a greater or smaller degree by its various members.

THE AMERICAN MEDICAL ASSOCIATION.

The fiftieth annual meeting of the association at Columbus, Ohio, June 6-9, was one of, if it was not indeed, the most numerously attended meetings since its organization. There were nearly 3,000 members registered, representative of the profession from all over the country.

It received an enthusiastic welcome by the Governor of the State and the city authorities and was magnificently entertained by the citizens. Indeed, the growing popularity of the association, as the representative body of scientific and ethical medicine in opposition to sectarianism and all sorts of quackery, was alike manifest in both professional and public sentiment.

State Medicine was well represented in the organization of that section and many valuable papers read before it, besides the one by Surgeon-General Sternberg, of which an abstract is given in this issue. But an abstract of the proceedings of the section is necessarily postponed to our next number.

MORTALITY AND MORBILITY REPORTS AND REVIEWS.

New York State Board bulletin for April: 10,383 deaths; death rate of 17.75 annually per 1,000 population. Zymotic deaths, 800. Compared with the corresponding month of 1898, there were 135 fewer deaths from zymotic diseases, the decrease being in measles, whooping-cough and diphtheria: the total number of deaths was, however, 375 more, and from consumption and local diseases there were 500 more deaths than in April, 1898.

City of New York, 3,550,053, April, 1899: Total deaths, 5,475; annual death rate per 1,000, 18.80; from cerebro-spinal meningitis, 54; typhoid fever, 28; scarlatina, 55; measles, 56; erysipelas, 30; whooping-cough, 29; diphtheria, 53; consumption, 708.

Borough of Manhattan, 1,953,569: Total deaths, 3,152; annual death rate per 1,000, 19.63: from typhoid fever, 14; diphtheria, 82; phthisis, 392.

Borough of the Bronx, 163,537: Total deaths, 282; death rate, 21.7; from typhoid fever, 5; diphtheria, 13; phthisis, 3.

Borough of Brooklyn, 1,231,548: Total deaths, 1,761; death rate, 17.61; from typhoid fever, 11; diphtheria, 47; phthisis, 209.

Borough of Queens, 134,139: Total deaths, 196; death rate, 18.3; from diphtheria, 8; phthisis, 19.

Borough of Richmond, 67,260: Total deaths, 84; death rate, 15.2; from diphtheria, 3; phthisis, 15.

Cases of Contagious Diseases Reported in 1898.—Manhattan, diphtheria, 6,548; croup, 351; measles, 9,916; scarlet fever, 5,694; typhoid fever, 1,453; smallpox, 12; total, 23,974. The Bronx, diphtheria, 665; croup, 29; measles, 1,241; scarlet fever, 986; typhoid fever, 82; smallpox, 0; total, 3,003. Brooklyn, diphtheria, 3,008; croup, 208; measles, 2,933; scarlet fever, 2,136; typhoid fever, 581; smallpox, 0; total, 8,866. Queens, diphtheria, 208; croup, 18; measles, 823; scarlet fever, 267; typhoid fever, 49; smallpox, 4; total, 1,369. Richmond, diphtheria, 149; croup, 7; measles, 143; scarlet fever, 65; typhoid fever, 61; smallpox, 0; total, 425. Increase of typhoid fever due to cases among returning soldiers.

Albany, 100,000: Total deaths, 189; death rate, 23.0; from typhoid fever, 13; diphtheria, 3; phthisis, 16.

Troy, 65,000: Total deaths, 105; death rate, 19.65; from typhoid fever, 6; phthisis, 15.

Utica, 55,000: Total deaths, 76; death rate, 16.6; from diphtheria, 3; phthisis, 5.

Syracuse, 120,000: Total deaths, 116; death rate, 11.75; from typhoid fever, 2; phthisis, 9.

Buffalo, 360,000: Total deaths, 400; death rate, 13.1; from typhoid fever, 3; scarlatina, 7; diphtheria, 5; phthisis, 43.

Rochester, 175,000: Total death, 205; death rate, 14.5; from typhoid fever, 2; diphtheria, 2; phthisis, 17.

Yonkers, 42,000: Total deaths, 48; death rate, 13.39; from phthisis, 10.

Cohoes, 25,000: Total deaths, 40; death rate, 19.46; from typhoid fever, 4; from phthisis, 7.

Kingston, 25,000: Total deaths, 29; death rate, 14.0.

Poughkeepsie, 25,000: Total deaths, 43; death rate, 15.0; from phthisis, 12.

Newburgh, 26,000: Total deaths, 36; death rate, 12.16; from phthisis, 5.

Schenectady, 27,000: Total deaths, 38; death rate, 16.6; from phthisis, 7.

Binghamton, 45,000: Total deaths, 57; death rate, 15.41; from typhoid fever, 2; from phthisis, 7.

Elmira, 35,000: Total deaths, 56; death rate, 16.8; from phthisis, 8.

Oswego, 22,000: Total deaths, 32; death rate, 17.45; from phthisis, 3.

CALIFORNIA.—San Francisco, 360,000, April, '99: Total deaths, 656; death rate, 18.53; from typhoid fever, 12; "specific febrile," 49; diphtheria, 8; scarlet fever, 8; consumption, 89.

Los Angeles, 103,000, April, '99: Total deaths, 195; death rate, 14.56; from diphtheria, 2; cerebro-spinal meningitis, 8; consumption, 22.

COLORADO.—Denver, 167,000, April, '99: Total deaths, 177; death rate, 10.60; from phthisis, 45.

CONNECTICUT.—The Secretary of the State Board sums up 166 towns, 89,245, April, '99: Total deaths, 1,169; death rate, 15.7; from typhoid fever, 8; diphtheria, 14; phthisis, 33.

New Haven, 112,000, April, '99: Total deaths, 152; death rate, 15.9; from typhoid fever, 2; diphtheria, 1; phthisis, 22.

For the year 1898: Diphtheria, 178 cases, 36 deaths. During the ten years previous to 1898, that the Board of Health has been notified of contagious diseases, there have been 2,476 cases of diphtheria, of which 797 proved fatal, showing a mortality of about thirty-three and one-half per cent. The difference in the average mortality from diphtheria for ten years and the mortality from the same disease for the last year must be due to some reason, and it is to be presumed that the general use of the diphtheretic antitoxin serum is accountable for it. Of typhoid fever there were 177 cases, 39 deaths, chiefly of soldiers brought into the city. From consumption, 1,843 deaths, 75 more than in 1897. There was also an increase in the number of deaths from pneumonia, attributed to the prevalence of grippe.

Hartford, 80,000, April, '99: Total deaths, 108; death rate, 15.3; from phthisis, 17.

Bridgeport, 65,000, April, '99: Total deaths, 71; death rate, 12.7; from phthisis, 5.

Waterbury, 45,000, April, '99: Total deaths, 62; death rate, 16.5; from phthisis, 6.

DISTRICT OF COLUMBIA.—280,250, 5 weeks, June 3, '99: Total deaths, 467; death rates, white, 14.52; colored, 23.78: 17.33; deaths from typhoid fever, 3; diphtheria, 10; cerebro-spinal fever, 26; phthisis, 64; acute respiratory diseases, 62.

ILLINOIS.—Chicago, 1,650,000, April, '99: Total deaths, 2,386; death rate, 14.52; from typhoid fever, 23; diphtheria, 56; croup, catarrhal, 10; phthisis, 228.

Measured by the average age at death of all who died in the city of Chicago thirty years ago and of those who died last year, the average duration of life in this city has more than doubled during a single generation.

That is to say: In 1869 there were 6,488 deaths recorded, with the age of each decedent given. The aggregate of the ages footed up 90,336 years, or an average of 13.9 years for every individual decedent, old and young. Last year there were 22,897 deaths similarly recorded, with an aggregate of 672,540 years of life, or an average age for each decedent of 29.4 years. This is an increase of 111.5 per cent.

INDIANA.—For quarter ending March 31, 1899: Deaths from all causes, 5,479 (1,291 more than previous quarter, and 1,335 more than for the corresponding quarter, 1898). Phthisis, 617; pneumonitis, 863 (343 more than for the corresponding quarter, 1898); from diphtheria, 132; scarlet fever, 43; typhoid fever, 88; whooping-cough, 21; cerebro-spinal fever, 148; measles, 12; smallpox, 48 cases, 1 death.

IOWA.—State Board bulletin for May reports infectious diseases for the preceding month:

Diphtheria.—Dubuque, Hilton Township, Iowa County; Manson; Franklin Township, Allamakee County; Blanchard; Hull; Alden; Alta; Dows; Vernon Township, Wright County; Roland; Derby; Nevada.

Scarlet Fever.—Marengo; Dubuque; Des Moines; Alden; Clear Lake; Alton; Garrison; Epworth; Lynnville; Correctionville; Vinton; Bernard; Doon.

Measles.—Marengo; Dubuque; Des Moines; Burlington; Boone; Nevada; Colo; McCallsburg; Alden; Shelby; Garrison; Lake City; Tabor; Rudd; State Centre; Avoca; Logan; Union Township, Fayette County.

Whooping-Cough.—Keokuk; Slater; Greene.

Typhoid Fever.—Dubuque; Burlington.

Cerebro-Spinal Meningitis.—Boone; Slater; Chariton; Dubuque; Davenport; Ossian; Decorah; Sigourney.

Smallpox.—Mechanicsville; Pioneer Township, Cedar County; Greenfield Township, Jones County; Wellman; Kimballton; Elkhorn.

Deaths in 14 towns with an aggregate population of 216,500, 208; death rate, 11.5.

Davenport, 40,000, report for May: Total deaths, 48; from cerebro-spinal fever, 9; phthisis, 4. For the year ending March 1 total deaths, 416; from phthisis, 35: bronchitis, 14: diphtheria, 11.

LOUISIANA.—New Orleans, 300,000 (90,000 colored), April, '99: Total deaths, 640—247 colored; death rates, white, 18.71; colored, 27.44: 21.33. Deaths from phthisis, 68; cerebro-spinal fever, 11; typho-malarial fever, 5; typhoid fever, 3.

MARYLAND.—Baltimore, white, 463,000; colored, 78,000: 541,000. March: Total deaths, 941; 252 colored; death rates, white, 17.85; colored, 38.76: 20.87; 34 died from infectious diseases, 115 from consumption, 29 from bronchitis, 40 from influenza, 8 from typhoid fever. Infectious diseases reported during the month, 215, 34 less than preceding month.

MASSACHUSETTS.—Boston, 541,827, April, '99: Total deaths, 979; death rate, 21.52; from typhoid fever, 8; diphtheria, 21; cerebro-spinal fever, 8; consumption, 116.

Fall River, June 3.—Eighteen cases of smallpox are now at the pest house and are doing well. There have been many suspicious cases reported, but all of these upon investigation have been found not to be smallpox. There have been vaccinated this week not less than 10,000 persons, and the operations will go on next week in all the mills and schools, in which there are 32,000 persons at work.

MICHIGAN.—2,168,548, April, '99: Total deaths, 2,965; death rate, 15.6; from typhoid fever, 36; diphtheria, 15; phthisis, 174.

For the month of April, 1899, compared with the preceding month, intermittent fever, remittent fever, inflammation of bowels and measles increased and erysipelas decreased in area of prevalence. Including reports by regular observers and others, consumption was reported present in Michigan in the month of April

1899, at 150 places; measles at 117 places; scarlet fever at 78 places; typhoid fever at 39 places; diphtheria at 38 places; whooping-cough at 25 places, and smallpox at 7 places.

MINNESOTA.—Minneapolis, 225,602, April, '99: Total deaths, 218; death rate, 9.24; from typhoid fever, 3; cerebro-spinal fever, 4; diphtheria, 3; phthisis, 30.

St. Paul, 215,582, April, '99: Total deaths, 135; death rate, 8.10; from diphtheria, 4; phthisis, 23.

MISSOURI.—St. Louis, 623,000, April, '99: Total deaths, 1,007; death rate, 19.32; from typhoid fever, 5; diphtheria, 16; cerebro-spinal fever, 31; phthisis, 104.

NEW JERSEY.—Newark, 235,000, 4 weeks, May 27, '99: Total deaths, 313; death rate, 16.95; from diphtheria, 5; typhoid fever, 6; phthisis, 39.

Paterson, 114,732, April, '99: Total deaths, 208; death rate, 18.1; from typhoid fever, 4; diphtheria, 5; cerebro-spinal fever, 23; phthisis, 16.

NORTH CAROLINA.—Twenty-one towns, population 142,489 (61,140 colored), report for April, '99, 150 deaths, 86 colored; death rates, white, 9.4; colored, 16.9: 12.6; deaths from consumption, 11.

OHIO.—State Board bulletin for May reports: Cases of infectious diseases reported to the State Board, four weeks ending April 29, 1899: From 50 localities, aggregate population 1,372,541, diphtheria, 50 cases, 11 deaths; scarlet fever, 141 cases, 5 deaths; typhoid fever, 88 cases, 33 deaths; whooping-cough, 68 cases, 2 deaths; measles, 707 cases, 17 deaths. Smallpox—Total number of cases reported since the first outbreak of the disease, April 6, 1898, is 1,757. There have been 27 deaths. Since Jan. 1, 1899, 1,088 cases and 22 deaths have been reported.

Cleveland, 395,000, April, '99: Total deaths, 502; death rate, 15.2; from typhoid fever, 10; diphtheria, 5; phthisis, 18; bronchitis, 16.

PENNSYLVANIA.—Philadelphia, 1,266,832, 4 weeks, May 27, '99: Total deaths, 1,666; from typhoid fever, 79; cerebro-spinal fever, 23; diphtheria, 59; phthisis, 215.

Pittsburg, 305,000, 4 weeks, June 3, '99: Total deaths, 361; death rate, 15.4; from typhoid fever, 18; diphtheria, 4; phthisis, 27.

SOUTH CAROLINA.—Charleston, 65,165 (36,295 colored), 4 weeks, June 3, '99: Total deaths, 186, 134 colored; death rates, white, 13; colored, 23.41: 18.20; from phthisis, 14.

UTAH.—Salt Lake City, 70,000: Deaths for April, 45; death rate, 7.71; from zymotic diseases, 3; phthisis, 2.

WASHINGTON.—Seattle, 75,000, April, '99: Total deaths, 70; death rate, 11.20; from phthisis, 8.

WISCONSIN.—Milwaukee, 280,000, April, '99: Total deaths, 326; death rate, 14.20; from typhoid fever, 1; scarlet fever, 3; diphtheria, 4; tubercular diseases, 51.

Smallpox.

Abstract of reports to the Surgeon-General of the Marine Hospital Service for the four weeks ending June 10, 1899:

Alabama—Mobile, 4 cases, 1 death.

California—Los Angeles, 8 cases; San Francisco, 1 case.

District of Columbia—Washington, 8 cases, 2 deaths.

Florida—Jacksonville, 2 cases; West Tampa, 3 cases.

Georgia—Savannah, 38 cases.

Illinois—Chicago, 2 cases.

Indiana—Evansville, 14 cases.

Kansas—Emporia, 5 cases, 1 death; Kansas City (April 29-May 6), 32 cases, 8 deaths.

Kentucky—Frankfort, 2 cases; Louisville (May 23d to date), 484 cases, 1 death; Mount Sterling, 2 cases.

Louisiana—Jalnerette, 1 case; New Orleans, 23 cases; Morgan City, 7 cases; Shreveport, 6 cases, 1 death.

Maryland—Baltimore, 2 cases; Steelton, near Baltimore, 4 cases.

Massachusetts—Boston, 2 cases; Fall River, 18 cases; Swampscott, 23 cases, 3 deaths.

Minnesota—Minneapolis, 2 cases; St. Paul, 2 cases.

Missouri—St. Louis, 24 cases.

Nebraska—Omaha, 1 case.

New Mexico—Las Cruces, 19 cases.

New York—Borough of Brooklyn, 1 case; New York City, 15 cases, 3 deaths.

North Carolina—One case, died.

Ohio—Cleveland, 24 cases; Columbus, 13 cases; Massilion, 1 case.

Oklahoma—Oklahoma City, 1 case.

Pennsylvania—Allegheny, 2 cases; Johnstown, 3 cases; Nicetown, 25 cases; Philadelphia, 36 cases; Pittsburg, 2 cases.

Porto Rico—Ponce, 5 cases.

Rhode Island—Providence, 2 cases.

South Carolina—Barnwell, 3 cases; Beaufort, 3 cases; Clarendon County, 3 cases; Edgefield County, 5 cases.

Texas—Galveston, 7 cases; Laredo, 2 cases.

Virginia—Newport News, 20 cases; Norfolk, 38 cases, 2 deaths; Portsmouth, 40 cases.

Washington—Seattle, 1 case; Spokane, 20 cases.

Wisconsin—Four cases.

Reports received from other sources:

Arkansas—Little Rock, May 23: Smallpox is still prevalent in the Choctaw railroad camps.

Indiana—Anderson, May 9: One case. Greenfield, May 10: On the occurrence of one case Dr. J. B. Black, Secretary of the City Board of Health, issued an order to-day, which was approved by the school trustees, requiring all the school children to be vaccinated by Monday next, or else they would be barred from attending school. The order created much feeling, and nearly 200 children were immediately taken out of school. This afternoon Dr. J. W. Selman, Secretary of the County Board of Health, issued a counter order, revoking the order issued by the City Board. Many people feel that unnecessary prominence has been given to the one case of the disease in this city, which was contracted at Liberty, and which is progressing nicely, and that there is no danger of contagion.

Dr. Morris, Health Officer at Liberty, on Saturday was given full power in the matter of suppressing smallpox by the State Board of Health and reported the result of his efforts. The doctor found four existing cases, all under strict quarantine. Hundreds of people have been vaccinated.

Indianapolis, May 8: Dr. Hurty, Secretary of the State Board of Health, received a telegram from Charlestown, Clark County,

last night stating that the smallpox had gotten beyond the control of the local Board of Health and calling for help.

Iowa—Prairie City, May 5: In view of the prevalence of smallpox in places and because of the return of the soldiers who are expected home soon from countries where the disease has been prevalent, the State Board of Health has adopted a resolution directing local Boards of Health to require vaccination throughout the State.

Kentucky—At a meeting of the State Board of Health, May 17, an order was passed forbidding the running of negro excursions until the epidemic is at an end. The prevalence of this disease among the colored people in Bowling Green, Henderson and other places fully justifies this action on the part of the board. The only places where smallpox has appeared among white people are Lebanon Junction and Henderson.

Shelbyville, May 23: Twenty-five cases of smallpox are reported at Finchville, this county. The State Board has decided to enforce vaccination.

Pleasureville, June 3: There is considerable scare in Henry County over smallpox, and the doctors are kept busy vaccinating people.

Mississippi—Vicksburg, May 9: A special inspector for the State Board of Health has returned from a visit to Maynard's railroad camp, on the Illinois Central, near Terry, and about twenty miles south of this city, where he reports having found 30 well defined cases of smallpox. All of the cases are among the negro employees of the camp and do not seem to have caused any excitement among the others. The board has taken charge of the camp and will use their best efforts to confine the disease to its present quarters.

Missouri—Kansas City, June 2: The Mayor issued a proclamation declaring that the smallpox here was under such excellent control that nearly all quarantines had been lifted and all patients in the pest hospital were convalescent; that more than enough time had elapsed since the last case was reported nearly two weeks before for any new cases to have developed. With that fact in view he felt safe in saying that the disease had been entirely and efficiently stamped out and that residents of and visitors to the city were in no danger whatever from this source.

New York—Buffalo, May 15: Smallpox is prevalent in many of the lake ports, and for that reason the United States Government is peremptory in its demand that the surgeons at the various ports shall use every effort to induce sailors to submit to vaccination a

a precaution against the spreading of the disease. Several days ago Dr. Stoner received a large supply of vaccine virus, and ever since it came in he has been vaccinating the crews of vessels as fast as the consent of the seamen and the vessel owners can be procured.

Tennessee—Memphis, June 6: The County Board of Health and the national health authorities are just entering upon an interesting correspondence relating to the spread of smallpox and other infectious and contagious diseases. Dr. Raymond is seeking to have the national quarantine law enforced against neighboring States for sending smallpox patients into Memphis. As Dr. Raymond understands the national quarantine law, it is a violation of that law for any State or Territory to export into another State or Territory any infectious or contagious disease. He wants the Surgeon-General of the Marine Hospital Service, which is, in effect and functions, the national health department, to construe the law and see that its requirements are lived up to by the States adjacent to Memphis.

THE PLAGUE is spreading at Alexandria. Up to June 9th there had been twenty-three cases and seven deaths. The disease is also increasing in China, especially in Canton, San Ning and Fat Shan. In the latter, which a Hong Kong paper calls "a city of death," the plague is raging with special virulence and carrying off its victims in large numbers. Shops and dwelling houses are closed and their inhabitants have fled, carrying the infection with them.

A dispatch to Lloyds from Malta says that vessels from Egypt can obtain coal and provsions in the quarantine harbor there under quarantine restrictions. Passengers must swear that they have not been in Egypt within twenty-one days, or otherwise they will be compelled to undergo twenty-one days' quarantine aboard ship. These precautions are taken in consequence of the outbreak of the plague in Egypt.

CANCER MORTALITY.—The great increase in the mortality from cancer in Great Britain ("Medical News") has led to the formation of a society to combat the disease, at whose initial meeting in London, on June 7th, it was pointed out that the number of deaths from cancer in New York City has doubled during the last ten years, and that it is calculated, if this increase is maintained, there will be more deaths from cancer in 1909 than from consumption, smallpox and typhoid fever combined. In Great Britain during the past ten years the ratio per million has risen from 385 to 787.

BOOK REVIEWS.

THE PRINCIPLES OF BACTERIOLOGY. By Dr. FERDINAND HUEPPE, Professor of Hygiene in the University of Prague. Translated from the German and annotated by Edwin O. Jordan, Ph. D., Assistant Professor of Bacteriology in the University of Chicago. Twenty-eight cuts, five colored plates. Pages, 465 + x. Price, $1.75 (9s.). The Open Court Publishing Co., Chicago, 324 Dearborn Street; London, Paternoster House, Charing Cross Road.

A comprehensive but singularly cogent work. Treats practically and theoretically of knowledge which should be universally disseminated—the Causes of Disease, Immunity from Disease, Vaccination, Inoculation, the Forms and History of Bacteria, Description of the Harmless and the Poisonous Forms, etc., etc.—all according to the very latest research and masterfully.

Medical practitioners who are not bacteriologists and have not the benefit of laboratory work, but to whom the facts of bacteriology are essential to enlightened practice, will here find a lucid summary of the nature of bacteria and all that is certainly known of their relation to disease. Moreover, the rôle of bacteria in the maintenance of health, as antagonizing forces; their power in stimulating the body cells under certain circumstances so as to increase the defensive powers of the human organism against untoward conditions. And, on the other hand, in their relation with the soil, their liability to change of character with the changes in the conditions of their habitat or surroundings, which explains the otherwise unaccountable outbreaks of certain infectious diseases in places where they have long lain dormant.

Indeed to the tyro in bacteriological knowledge, or to those who are already versed in the facts with regard to it, which have been accumulating during recent years; to all who would know what bacteriology is, what it has accomplished and what problems are still in process of solution with regard to it, no book on the subject that has fallen under our observation hitherto, so well serves as this book by Professor Hueppe.

SEWER DESIGN. By H. N. OGDEN, C. E., Assoc. M. Am. Soc. C. E., Assistant Professor of Engineering, Cornell University. First Edition. 12mo, cloth. Pp. 246. Price, $2.00. Order through

your bookseller, or copies will be forwarded postpaid by the publishers on the receipt of the retail price. New York: John Wiley & Sons. London: Chapman & Hall.

This book represents an elective course of lectures given in the College of Civil Engineering, Cornell University. Supplementing as it does the regular course in sanitary engineering, it preserves without duplication a continuity in the two courses. The volume opens with a sketch of the development of sewerage systems, laying special stress upon the late Col. Waring's advocacy of the "separate system," which is described, and arguments for this system are summed up, as against the "combined system." Next follows "preparatory maps and data" and the necessary surveys, soundings, borings, leads, etc., for their making, preliminary to all sewerage works. The remainder of the volume is divided into sixteen chapters: Studies and computations of the rainfalls, proportion reaching the sewer, study of the surfaces and soils, ground water, grading, self-cleansing velocities; all parts appropriately illustrated by plates and diagrams, together with numerous tables of data, rates of rainfall velocities, flush waves, etc., elucidating and facilitating the details. Altogether it is an excellent introduction to the work of the sanitary engineer and of much practical utility.

REPORT OF CHIEF OF THE WEATHER BUREAU, U. S. DEPARTMENT OF AGRICULTURE, 1897-98. 4to, pp. 350, with numerous plates, charts, diagrams and tables. Washington: Government Printing Office.

A report of great practical utility to agriculturists, mariners and physicians. It is divided into three parts. Part I deals with administrative work, new work and special investigations, extension of West India hurricane service, the establishment of new stations, coöperation, corporations, inspections and expansions into new fields; aerial work, kite construction and observations, loss of farm property by lightning; forecasts and warnings; climate and crop service, etc. Parts II and III deal with climatology in detail, begins with a list of observing stations and a tabulated statement of geographical conditions of the several stations. Next follow tables of latitude, longitude, elevation, etc., and of changes in Weather Bureau stations during 1897, hourly averages of atmospheric pressure, temperature and wind from records of twenty-eight stations; monthly and annual metereological summaries for 145 weather bureau stations; monthly and annual precipitations; snowfalls; sunshine and cloudiness; climate of Cuba; temperature, rainfall

and humidity of San Juan, Porto Rico, and weather of Manila. Altogether a masterful comprehension of and lucid report upon conditions of universal interest, from which practical conclusions for future guidance may be deduced.

A CENTURY OF VACCINATION AND WHAT IT TEACHES. By W. SCOTT TEBB, M. A., M. D. (Cantab.), D. P. H. Second Edition. 12mo, pp. 466. London: Swan, Sonnenschein & Co., Lim., 1899.

A book evidently based upon a preconceived theory or mere opinion of the subject of which it treats, without knowledge of or regard to the facts in conflict with it. For it is inconceivable, from a scientific point of view, how any open-minded person, with sufficient intelligence to comprehend the statistics adduced, could so use them without wilful purblindness to a correct version. And so, too, of Jenner's discovery. Had the purpose of the author been to display the truth in his investigation of the evidence he would not have disjoined the continuous experiments and recorded observations of Jenner for several years before he announced it, which the author fails to notice, but gives instead a scrappy account of Jenner's contention with his opponents and wholly omits the record of facts upon which the discovery of the protective power of vaccination was founded. If, before proceeding to pervert the statistics of "A Century of Vaccination and What It Teaches," he had taken a glance backward over the preceding century and what it taught, he might have learned that at the end of it—when Jenner began his experiments—Gilbert Blane estimated that "an adult person who had not had smallpox was scarcely met with or heard of in the United Kingdom." When servants were advertised for, it was common to specify "that they must have had smallpox in the natural way."—In 1688, in an advertisement for a counterfeiter, it was noted as a means of his identification that he was "without pock-holes." At the Institution for the Indigent Blind two-thirds of the applicants were made blind by the smallpox.

It attacked the high as well as the humble. In the family of William III. of England, his Queen, Mary, his father, his mother, his uncle and two cousins, children of James I., all died of the smallpox and the King himself barely escaped with his life. Dinsdale, who went to St. Petersburg to inoculate the Empress Catharine, says that 2,000,000 people died in a single year in the Russian Empire from smallpox. In 1707, in Iceland, out of a population of 50,000, 18,000 died—36 per cent. In Mexico in the sixteenth century, 3,500,000 people died, leaving, in some places, scarcely enough alive to bury the dead.

During the century one emperor and two empresses of Austria, six archdukes and archduchesses, an elector of Saxony, an elector of Bohemia, a dauphin and a king of France, a king of Sweden and a czar of Russia were all numbered among its victims. So fearful were its ravages that Bernouilli estimated that during the century 60,000,000 persons died of it. But this knowledge seems to have been wholly unnecessary to Dr. Tebb's purpose. He would keep it out of sight or attempt to account for it by the prevailing ignorance and neglect of sanitary measures. Moreover, for the century of vaccination he also contends that smallpox still depends upon filthy local conditions; that it is a disease of the poor and of communities who neglect sanitary measures, which contention, if true, should enable him to identify the prevalence of smallpox in the United States at this present time and at all other times and everywhere, with unsanitary local conditions, instead of among unvaccinated communities, whether cleanly or otherwise, as during the centuries preceding vaccination.

AN EPITOME OF THE HISTORY OF MEDICINE. By ROSWELL PARK, A. M., M. D., Professor of Surgery in the Medical Department of the University of Buffalo, etc. Based upon a course of lectures delivered in the University of Buffalo. Second Edition. Illustrated with portraits and other engravings. 6½x9½ inches. Pages 370 + xiv. Extra cloth, $2.00 net. Philadelphia; The F. A. Davis Co., Publishers, 1914-1916 Cherry street.

The call for a second edition of this book within a year after its first appearance is evidence of its interest to physicians. Nevertheless, we are constrained to regard it as being rather an *abstract* than an epitome of the history of medicine. With a few exceptions it is good as far as it goes. Among the exceptions, however, of both commission and omission nearly two pages are devoted to the exploits of Cornelius Agrippa, born in 1486, a vain-glorious and disreputable quack, while the works of that other Agrippa, M. Vipsanius, who introduced a public water supply into, established public baths in and sewered, Rome fifteen centuries before, have been passed over without notice. Two pages are devoted to Hahnemann, Spurzheim and Gall. Stephen Hales, Capt. Cook and James Lind, of the same age, are unnoticed. And instead of the supplementary chapter on "Latrotheurgic Symbolism," we wish it had been on bacteriology.

But we are not condemning this book—far from it. Every physician should be familiar with its contents. It is admirably

written, the illustrations are good of their kind and altogether the work is all that the author claims for it, an "introduction to a more comprehensive account, which alone should satisfy the more studious."

THE NEWER REMEDIES: Including Their Synonyms, Sources, Methods of Preparation, Tests, Solubilities, Incompatibilities, Medicinal Properties and Doses as Far as Known, Together with Sections on Organo-Therapeutic Agents and Indifferent Compounds of Iron. A Reference Manual for Physicians, Pharmacists and Students. By VIRGIL COBLENTZ, A. M., Phar. M., Ph. D., F. C. S., etc., Professor of Chemistry and Physics in the New York College of Pharmacy; Author of "Handbook of Pharmacy;" Member of the Chemical Societies of Berlin and London; Fellow of the Society of Chemical Industry, etc. Third Edition. Revised and very much enlarged. Price, $1.00 net. Philadelphia: P. Blakiston's Sons & Co.

This is a timely and useful manual. The constantly increasing number and complexity of the new remedies render it necessary for the physician and apothecary to keep informed concerning them. To supply this information is the purpose of this book.

It appears to have been the endeavor of the author to present as complete a list as possible. The various articles are arranged in a concise alphabetical form, synonyms being given in their proper places, with cross references, so that the information wanted can be found with the least expenditure of time and trouble. It is needless to point out that it contains a great deal of material that is not to be found in the text books. It allows the physician to prescribe useful agents intelligently, and furnishes the druggist needed information as to the proper methods of preparation, solubilities, incompatibilities, etc.

PLAIN WORDS ABOUT FOOD. Edited by ELLEN H. RICHARDS. Pp. 176; 12 full-page illustrations. Cloth. Price, $1.00. Boston, Mass.: Home Science Publishing Company.

The Rumford Leaflets, which were distributed at the Columbian Exposition at Chicago from that part of the Massachusetts exhibit known as the Rumford Kitchen, have been in such demand ever since that it has become necessary to put them in more permanent form. Mrs. Ellen H. Richards and Mrs. Mary Hinman Abel have accomplished the task and, it hardly need be added, have done it well. Much new matter upon public lunchrooms and food for institutions has been added.

The New England Kitchen in Boston has worked out the problem of school lunches successfully, and many of its experiments in this direction are recorded in this volume. The illustrations alone will answer many questions as to the arrangement and furnishing of public kitchens and lunchrooms.

A REVIEW OF RECENT LEGAL DECISIONS AFFECTING PHYSICIANS, DENTISTS, DRUGGISTS AND THE PUBLIC HEALTH, together with *A Brief* for the prosecution of unlicensed practitioners of medicine, dentistry and pharmacy, with a paper upon manslaughter, Christian Science and the law and other matter. By W. A. PURRINGTON, of the New York Bar, Counsel of the Dental Society of the State of New York and Lecturer on Dental and Medical Jurisprudence in the New York College of Dentistry, and one of the Collaborators in "A System of Legal Medicine," by Allen McLane Hamilton and Others, etc. 12mo, pp. 105. Price, 50 cents. New York: E. B. Treat & Co.

Mr. Purrington has had more extensive experience and is more practically familiar with the subject of this treatise than any other person known to THE SANITARIAN, and we take pleasure in commending the treatise as a safe guide.

CONTEMPORARY LITERATURE.

LIFE-SAVING HEROES.

The "Heroes of Peace," celebrated by Mr. Gustav Kobbé in the June "Century," are the volunteer life-savers. Many deeds are recorded that equal the bravest exploits of the battlefield.

For many years before the United States life-saving service was established, the Massachusetts Humane Society maintained, along the coast of that State, houses of refuge for shipwrecked sailors, and stations equipped with life-saving apparatus, in charge of keepers, who, when the emergency arose, summoned volunteer crews. This volunteer life-saving service is still kept up, and is able not only often to render effective assistance to the regular government crews, but occasionally also to save life when the nearest United States life-saving station is too far from the scene of disaster for its crew to arrive in time. The rivalry between these two corps has been most generous. There have been no bickerings, no attempts of one to outwit the other, but a singleness of im-

pulse to serve in the cause of humanity. Naturally the gold and silver medals awarded by the United States government for heroism displayed in saving life have been more frequently bestowed upon members of the regular service, as this extends along our entire seaboard and lake coast, but the volunteer corps has had its share of honor. . . .

But by far the greater number of medals for heroism displayed in saving life from drowning have been awarded to individuals—people from the most varied walks of life; men of high social position, Western Indians, a Southern negro, pleasure-seekers along the coast, a Japanese cabin steward, steamboat men, and officers and men of the United States army, navy and revenue-cutter service. Every section of the country seems to have contributed its hero or heroes to the roll of honor. There are also heroines on that roll. A number of women hold silver medals, and two women the gold medal. Silver medals have also been awarded to mere boys and girls for displays of daring far beyond their years. Frederic Kernochan was a lad when he received a silver medal for saving a woman from drowning in the Navesink River, near Highlands, New Jersey; and Marie D. Parsons, a girl of only ten years when she rescued a child at Fireplace, Long Island. Nor was Edith Morgan, of Hamlin, Michigan, much beyond girlhood when she tried, with her father and brother, to row to a vessel capsized three miles out. Beaten back by the heavy waves, she aided in clearing away the logs and driftwood from the beach so as to make a track for the surf boat. At a previous rescue she had stood for six hours in the snow, hauling at the life-line, in landing sailors from a wreck.

SLANDERING OUR ARMY.

The same gentlemen who have predicted the continuance of the war for centuries to come have also spread abroad many tales to the effect that our officers and men have conducted the fighting against the Filipinos in a wanton manner, with needless sacrifices of life and with general disregard of the rules and principles of civilized warfare. We shall consider all this to be baseless slander until some evidence can be brought forward to prove the charges. There have been assertions, furthermore, in various quarters that our soldiers in the Philippines have been suffering needlessly and have been ill provided for. The best evidence obtainable goes to show that no troops at a distance from home and engaged in actual warfare were ever so well supplied with

food, medicine, clothing, and hospital care and facilities as our army now in the Philippines. The conditions of campaigning in Luzon subject our men to no little hardship in spite of everything that can possibly be done; and the end of the war will be welcomed by all thoughtful and sensible people with a deep sense of relief and gratitude. But while we have business of that kind on our hands it is not well to exaggerate the dark side of the picture. And it is folly that approaches criminality to plot schemes for hampering our government in its efforts to end quickly an unhappy business that nobody enjoys.—From "The Progress of the World," in the "American Monthly Review of Reviews" for June.

THE DISCOVERY OF TRICHINA.

In 1833 James Paget, interne in a London hospital, while dissecting the muscular tissues of a human subject, found little specks of extraneous matter, which, when taken to the professor of comparative anatomy, Richard Owen, were ascertained, with the aid of the microscope, to be the cocoon of a minute and hitherto unknown insect. Owen named the insect *Trichina spiralis*. After the discovery was published, it transpired that similar specks had been observed by several earlier investigators, but no one had previously suspected, or, at any rate, demonstrated their nature. Nor was the full story of the trichina made out for a long time after Owen's discovery. It was not until 1847 that the American anatomist Dr. Joseph Leidy found the cysts of trichina in the tissues of pork; and another decade or so elapsed after that before German workers, chief among whom were Leuckart, Virchow and Zenker, proved that the parasite gets into the human system through ingestion of infected pork, and that it causes a definite set of symptoms of disease, which hitherto had been mistaken for rheumatism, typhoid fever, and other maladies. Then the medical world was agog for a time over the subject of trichinosis; government inspection of pork was established in some parts of Germany; American pork was excluded altogether from France; and the whole subject thus came prominently to public attention. But important as the trichina parasite proved on its own account in the end, its greatest importance, after all, was in the share it played in directing attention at the time of its discovery in 1833 to the subject of microscopic parasites in general.—"Harper's Magazine."

THE INDIAN PLAGUE—ITS TRAVELS IN THREE YEARS.

A very high Indian official, who had visited the bedsides of thou-

sands of plague patients, once said: "I know as much about the plague as any man alive, *and that is absolutely nothing.* Under the title, "A Menace to Christendom," Mr. Julian Ralph has gathered all that is of importance of what is known and understood concerning this scourge. His article appears in the current issue of "Harper's Weekly," and is another striking evidence of the energy and enterprise displayed by that journal in bringing before its readers the all-important affairs of the day.

Mr. Ralph shows that there are four kinds of plague, and also how easily it may be carried from one country to another. He points out why Europe is poorly protected, and lays emphasis on the fact that even the United States must guard her own doors. Absolutely the worst feature about the whole matter is that almost every doctor who has had plague patients insists on carrying away plague germs for the purposes of study. These germs are in fact exported to every corner of Christendom by the doctors and the medical students who have gone to India, first from Japan, and since from every part of Europe and America, to study the epidemic. Mr. Ralph and the journal that employs him deserves great credit for calling to the world's attention a danger which, were it realized, might devastate the civilization of the world.

WOMAN'S RIGHTS MOVEMENTS.

"The Reverses of Britomart" is the taking title suggested by an episode in Spenser's "Faerie Queene," under which Mr. Edmund Gosse discusses in the June number of the "North American Review," the present position and prospects of the Woman's Rights Movement. He deals chiefly with the reverses which the movement has recently sustained in a vein of which the following may serve as a sample:

"One of the leading feminists of the last campaign asserted that 'to reduce woman to the bondage of family life is to treat her as an inferior animal.' I will not offer any comment on the wisdom or the levity of such a conception of the position of woman, but I must point out that it can only be held in a state of society where there is an absolute basis of political security. If we are to arrive at a condition in which we shall be able to admit that to attach woman to the guidance of the family is to treat her as an inferior animal, it can only be when all chance of material insecurity has passed away. Disturbance of the kind which a threat of war or revolution brings with it, instantly creates for men a field of energy into which women cannot enter; and, at the same time, it makes

them more secure in that special sphere where men intrude only when they have no more suitable occupation. I think it is Mr. Herbert Spencer who observes that in primitive societies the unit is the family, and only in advanced civilization the individual. Something of the same kind is true of the influence of war and peace; the latter encourages the individual, the former, with the first threat of disturbance, binds together the units into a family.

NUTRITIOUS BIRDS.

The flesh of birds differs in quality according to the food on which they live. Such as feed upon grain and berries afford in general good nourishment, if we except geese and ducks, whose flesh is hard of digestion. A young chicken is tender and delicate food, and extremely well adapted for use when the digestive powers are weak. Of all tame fowls the capon is the most nutritious. Turkey and guinea-fowls afford substantial aliment, but are not as welcome to the stomach as to the palate. In all birds those parts are most firm which are most exercised; therefore the wings, and in the larger birds the legs, are commonly the toughest. The flesh of wild birds in general, though more digestible, is less nourishing than that of quadrupeds, being dryer on account of the constant exercise which birds take. Those birds which subsist upon worms, insects or fishes do not furnish wholesome food.—Albert G. Evans, in June "Lippincott's."

ABOUT PERFUMES.

The too free use of perfumes about the person has been avoided for many years, and held inadmissible in good society, the merest hint of a faint odor being all that was possibly allowed. Recently this edict of good taste has not been so strictly regarded, and such perfumes as violet and sandal-wood, both of them expensive ones when pure, together with heliotrope, are somewhat in favor again. It is quite likely that the very general wearing of large bunches of violets has led the way to this.

It is not easy to eradicate the love of perfumes any way, for the nerves made to appreciate them will always demand satisfaction; and since the race, civilized or uncivilized, has existed, the love of perfumes has existed too. Even animals are sensitive to perfumes; and it used to be said that one of the helps of the great horse-tamer Rarey was a bunch of violets.

Our grandmothers, and theirs before them, sometimes scented their hair-dressings by means of an apple stuck full of cloves and

spices, kept a long time in the pomade, which was perhaps as simple a method and provided as simple an aroma as could have been invented. They loved, too, the odor of patchouli, with which everything coming from India or China in those rich old days of the India trade was loaded—somewhat too powerfully for modern taste; but perhaps they loved the scent more for its association with the wonderful shawls and scarfs and stuffs which it accompanied than for itself.—"Harper's Bazar."

PARIS EXPOSITION OF 1900.

United States Commission—Chicago, Auditorium Building; New York, Equitable Building; Paris, 20 Avenue Rapp.

THE EXHIBIT OF SOCIAL ECONOMY, HYGIENE AND PUBLIC CHARITIES.

(*a*) *Social Economy.*—The section for social economy will contain exhibits illustrating (1) the social and economic condition of the laboring classes throughout the world; and (2) the efforts made and institutions founded with a view to ameliorating these conditions. The interests to be represented by these exhibits may be grouped under the following heads:

(1) The relation between the State and labor, including factory legislation; the regulation of the employment of women and children; labor bureaus; employment bureaus, etc.

(2) Conditions of labor in large and small industries, including apprenticeship, stability of employment, safety devices for workshops, hours of labor, holidays, etc.

(3) Methods of industrial remuneration, including wages, cooperation, profit sharing, premiums, sliding wage scales, etc.

(4) Provident institutions, including savings banks, insurance societies, building and loan associations, etc.

(5) Workingmen's institutions, including labor organizations, clubs, libraries, etc.

(6) Workingmen's dwellings.

(*b*) *Hygiene.*—The section for hygiene will contain exhibits illustrating (1) the most notable recent advances in the science of hygiene, especially those due to American initiative; and (2) applications of this science in promoting the welfare of the individual;

in securing healthy homes; in constructing and caring for tenement-houses, schools, factories and public buildings; in providing for the sanitation of cities and country towns; and in preventing the introduction of disease into a country at seaports or across frontiers.

(*c*) *Public Charities.*—The section for public charities will contain exhibits illustrating the work which is being done through private initiative, or by public authority, for the protection and relief of the defective, dependent and delinquent classes. These exhibits will represent (1) the history of this work, including legislation, organization and financial support; (2) aid afforded both children and adults in almshouses, hospitals, dispensaries, asylums, reformatories and other typical institutions; and (3) schools for the blind, deaf and the feeble-minded.

Importance of the Social Economy Exhibit.

The French authorities intend to make social economy one of the most important features of the coming exposition. Their own section will contain exhibits representing the social and industrial life of the laboring classes throughout France:—their dwellings, their occupations, their amusements, their peculiar social and economic institutions and various other provisions for their material welfare and their moral and intellectual development. The French exhibit of social economy will thus add a great deal to the significance and value of the entire French section, since it will supplement the commercial and industrial displays and aid in their interpretation.

A similar exhibit should be prepared for the United States section. This country has taken a leading part in recent social and economic reforms and is at the present time attracting the attention of the entire civilized world, and it is certain that an exhibit presenting a clear picture of American social and economic conditions would deeply interest every thoughtful foreigner who visits the exposition.

THE SANITARIAN.

AUGUST, 1899.

NUMBER 357.

CLIMATE AND SEA VOYAGES IN THE TREATMENT OF TUBERCULOSIS.[1]

BY SIR HERMANN WEBER, M. D., F. R. C. P.,
Consulting Physician to the German Hospital, London, and the Royal National Hospital for Consumption, Ventnor.

At the International Medical Congress at Berlin in 1890 I had the honor of introducing the discussion on the Climatic and Hygienic Treatment of Pulmonary Tuberculosis. On that occasion I expressed my opinion that climatic treatment by itself was insufficient in most cases; that careful supervision and guidance of the patient by the doctor was necessary, and that, therefore, treatment in special establishments was to be preferred in the majority of cases, whilst for poor patients it was urgently required.

In the present Congress you have appointed me to introduce the discussion on climatic treatment. My opinion, gentlemen, is now more decided than at the former Congress, for I hold that climate is really important, but is insufficient unless there be careful medical supervision and hygienic and dietetic guidance. Obeying your directions, I shall endeavor in a short survey to explain what share climate can take in the treatment of tuberculosis. I will divide my rapid summary under four heads:

(1) Climates of mountains and high altitudes.

(2) Inland climates of low elevation, including those of forest, of deserts, and of Egypt.

(3) Climates of the coast and of small islands; sea voyages.

(4) Short indications for the use of different climates in different cases of tuberculosis.

[1] Read before the International Tuberculosis Congress in Berlin, May 24-27, 1899.

I. CLIMATES OF MOUNTAINS AND HIGH ALTITUDES.

The differences are great between the various localities which are grouped together under this heading. Whilst in the tropics an elevation of 1,800 to 3,000 metres over the sea is necessary, in the latitudes further from the equator (46 deg. to 45 deg.) an elevation of 400 to 500 metres is generally sufficient. When the surroundings of a place are much higher than the place itself, the effect of high altitude is in many respects diminished; the effect is increased when the surroundings are lower.

You know, gentlemen, that in former years the prevailing opinion was that consumption was more likely to be cured in warm health resorts than in cold ones, and you know also how scanty were the grounds for this opinion. You are aware that in Lima, the capital of Peru, about twelve degrees south of the equator, consumption is especially frequent, and runs a rapid and fatal course; but that patients, if they go early enough into the neighboring Peruvian Andes, at an elevation of 2,500 to 3,000 metres above sea level, mostly get better. For the recognition of this fact we are chiefly indebted to the late Dr. Archibald Smith, who for thirty years exercised the medical profession, partly in Lima itself, and partly in the silver mines of Cerro de Pasco, nearly 4,000 metres above the sea. The custom of sending consumptives from the hot coast of Lima to the cool altitudes of the Andes is supposed to have existed from "unknown times." Although I myself have never been in Lima, yet by chance correspondence with the coasts of Peru and Chili, I have had the opportunity of confirming this fact in a series of patients.

In Europe we have mostly given the late Dr. Hermann Brehmer, of Görbersdorf, the credit of having ascertained the influence of mountain climate in pulmonary consumption; but a recent excellent work by Geheimrath, Bernhard, Schuchardt,[2] in Gotha, shows that others did this before Brehmer, and that foremost amongst them Brockmann, in an excellent contribution[3] to Holscher's *Annalen* in 1843, proved the favorable influence of a stay in the Upper Harz in regard to the prevention and cure of scrofula and tuberculosis, and that soon afterwards C. F. Fuchs,[4] though un-

[2] **Zur Geschichte der Anwendung des Hochenklimas (Gebirgsklimas) behufs Heilung der Lungenschwindsucht (Lungentuberculose), Jahrb. d. Königl. Akad. gemeinnütziger Wissenschaften zu Erfurt, neue Folge, Heft xxiv, 1898.**

[3] **Der Oberharz, ein Schutzt und Heilort für tuberculöse Schwindsucht, Holscher's Annalen für die gesammte Heilkunde, 1843.**

[4] **Das Verhältniss der Krankheiten in senkrechter Richtung von der Küste der Nordsee bis zum Rücken des Thüringer Waldes, Janus: Central Magazin, Gotha, 1851 and 1853.**

acquainted with Brockmann's publication, made similar communications. Brockmann wrote in 1843, Fuchs in 1851, and the first edition of Brehmer's book on chronic pulmonary phthisis appeared in 1857, preceded by a similar work in 1856.

The main characteristics of high altitudes are: (1) Low atmospheric pressure; (2) small amount of the absolute and relative humidity; (3) low temperature in the shade; (4) great warmth of the sun; (5) great amount of light; (6) rarity of the clouds; (7) the purity of the air, especially in regard to microbes, to which the bright sunlight and free access of air are antagonistic. The physiological effects of high altitudes are: (1) Amplification of the respiratory movements; (2) strengthening of the muscles of respiration; (3) strengthening of the heart and circulation; (4) increase in the amount of watery vapor and carbonic acid given off from the lungs; (5) increased activity of the skin; (6) increase of appetite and of the amount of food taken, improvement of the digestive functions; (7) improvement in the quality of the blood, and in the nutrition of the organs, particularly of the lungs; (8) increased activity of the nervous system.

We may state that mountain climates are highly stimulant and tonic, but require a certain power of resistance on the patient's part.

It is difficult to exactly ascertain the results of treatment. I myself could follow out the further progress of only a relatively small number of cases. In 144 patients only have I statements on the later condition. Of these 144 patients I have noted cure in 36; in 56 there was improvement in the local signs and in the general nutrition: in 52 cases there was either no improvement, or deterioration, or death within three years of the treatment. Only the smaller portion were treated in special sanatoria; in the remaining larger portion the medical supervision varied very much. The results would doubtless have been much better if the patients had placed themselves under stricter medical guidance, as they were advised. In many cases as a consequence of false steps relapses occurred which confined the patients for weeks and months to their bed or their room, and prevented recovery (which had previously seemed probable) from taking place. In seven cases, however, recovery seemed nearly complete when through some mistake, mostly over-exertion, a deterioration set in, which afterwards led to the fatal termination. I must, however, add that Dr.

C. Theodore Williams,[5] of London, records better results in his great experience than I do. Dr. Lucius Spengler's[6] results published from his experience in Davos between 1887 and 1890 are also more favorable. Still more satisfactory, however, are the results which Dr. Turban[7] has obtained in his sanatorium at Davos (66.1 per cent. of absolute and relative recovery), that is, obtained by an association of high Alpine climate with sanatorium treatment.

In regard to the prevention of tuberculosis by high altitudes, my results are decidedly better. In 40 cases of children from tuberculous families, education in the mountains, with good diet and plenty of fresh air, has had a favorable result, and only in four of these cases has tuberculosis under favorable conditions afterwards developed. Seaside places have likewise a prophylactic action, but so far as I can conclude from my experience, they have a greater influence against the so-called typical scrofulous conditions than against pulmonary tuberculosis, whilst with high altitudes the reverse is the case. Amongst the elevated localities of which I have experience, I give certain places in Peruvian Andes the preference over all others; especially Jauja and Huancayo, about 3,000 metres above sea level, and the rather less elevated Quito, near the equator. The advantages are—the great dryness and rarefaction of the atmosphere, the strong isolation, the medium temperature and equability of the temperature, which, day and night, summer and winter, is said to vary only between 14 deg. and 18 deg. C. The great drawback, especially for Europeans, is the long, tiring, and costly journey.

The Rocky Mountains, in the United States of America, contain likewise many good, but mostly not yet developed, places. The best arrangements for medical treatment are afforded by Colorado Springs, Manitou and Denver, the two first over 1,800 metres, the last about 1,500 metres, above sea level. These places are much less equable in their climatic features than are the localities mentioned in the Andes; in this respect they resemble much more the High Alps of Switzerland; the Rocky Mountains are, however, somewhat drier and warmer than Davos and St. Moritz, and also more windy. Denison, Solly, and C. T. Williams have reported

[5] The Treatment of Pulmonary Tuberculosis by Residence at High Altitudes, Practitioner, June, 1898, p. 633.

[6] Zur Phthisiotherapie im Hochgebirge, Fortschritte der Krankenpflege, 1893.

[7] Beiträge zur Kenntniss der Lungen-Tuberkulose, by Dr. K. Turban, 1899, p. 154.

on these places. Private sanatoria have as yet hardly been established in the Rocky Mountains, but are better represented in the lower North American mountains; and the excellent sanatorium in the Adirondacks, under Dr. Trudeau's management, offers an example which deserves to be copied. The flourishing Climatological Association of North America will, it is to be hoped, encourage the foundation of many sanatoria.

In the Swiss Alps all of you are acquainted with Davos, Arosa, St. Moritz, Wiesen, Leysin and Les Avants. I shall, therefore, not consider these localities further, nor the places on the relatively lower German mountains; the latter are rich in sanatoria, which will probably be reported on by the opener of the discussion on sanitorium treatment.

In France the Société des Sanatoria de France is endeavoring to more extensively develop climatic treatment in the inland, while an analogous society does the same for the coast, and to this subject we will come back later. The Trespoey Sanatorium, near Pau, and the Durtol Sanatorium, in the Auvergne, are already opened.

The highlands of South Africa thirty or forty years ago were valued as unfailing climates, but experience has limited their reputation. Their disadvantages are the great heat and dryness in summer, the frequent alternation in winter of great heat in the daytime with great cold in the night-time, and the frequency of wind and dust. However, of 21 cases, I have had seven lasting recoveries amongst patients in the first stage of pulmonary tuberculosis; these patients settled there later, and occupied themselves or still occupy themselves with agriculture. Dr. Symes Thompson[8] and Dr. Hillier,[9] of London, have given us information of these regions.

Bloemfontein, Alliwal North, Kimberley, Burgersdorp, Pretoria, Beaufort West, and Cradock belong to the best known places in the more elevated regions (1,300 to 1,500 metres). Regular sanatoria are not yet developed. Harrismith, in the Drakenberg range, with a sanatorium there, would be of the greatest utility for the extensive less elevated regions of the southeastern coast of South Africa, and particularly for the not very hygienic but otherwise flourishing coast towns.

[8] On the Elevated Health Resorts of the Southern Hemisphere, Med. Chir. Trans., 1873.

[9] The Climate of South Africa, Practitioner, June, 1898, p. 649.

II. INLAND CLIMATES OF LOW ELEVATION, INCLUDING THOSE OF FORESTS, OF DESERTS, AND OF EGYPT.

Like all of you, I have seen many cases of recovery on level land and even in large towns, but the proportion of recoveries to the number of patients was small. The recoveries have been chiefly in persons who spend much of their life in the open air and take sufficient food, especially milk, for instance, in the case of gardeners and those employed in agriculture and land-owners, but also in bakers who deliver the bread, and in Black Forest clock-makers who carry their clocks about for sale, and who have exchanged their work in shut-up rooms for work in the open air. The proportion of recoveries was certainly greater at places with shelter from wind, much sunlight and medium temperatures, such as Pau, Gardone-Riviera, Arco, Meran, Montreux, Lugano, Locarno and Pallanza; but repeatedly at these places also well-founded hopes of recovery have been destroyed by too long walks, by exciting games of cards in smoky rooms, and by other harmful factors.

In the question of the influence of forest on the soil and the air of a locality, Ernest Ebermeyer[10] has made a valuable study, but our knowledge of the effects of forest in cases of tuberculosis is very limited. In general, one may say that in a forest the ground (on the average for a year) is some degrees colder, and that the ground and the air are somewhat moister; the difference between day and night temperatures is less; the movement of the air is diminished; rain is more frequent; there is less light, and the amount of ozone in the atmosphere is increased. These characteristics are less marked in forests of pine than in forests of deciduous trees, and in the latter are less in winter than in summer, when the trees are in foliage. There are, however, other modifications in the atmosphere of forests which cannot be exactly estimated—possibly changes in the energy of the oxygen due to the vital processes taking place in the leaves—and which exert a refreshing influence. There are also exhalations from the trees to be taken into account, especially in pine forests, where the aromatic substances in the air may possess an antiseptic influence. Then the protection from wind should be considered, which is felt not only in the forest itself, but likewise in the neighborhood. It is therefore important to have a wood, especially of pine, in the

[10] Die physikalischen Einwirkungen des Waldes auf Luft und Boden. Aschaffenburg, 1873.

direction from which the general cold winds come. From cold local winds also a forest not rarely affords shelter. Thus one may observe on mountain declivities, when the upper part of the slope is covered with trees, that the tender plants and shrubs below the wood are thereby sheltered from the cold air, which during the night moves downwards from the summit, whereas similar plants growing at an equal height, but at a spot not protected by forest, are frozen. From what has been said I should not be in favor of erecting sanatoria in level dense forests of deciduous trees, for the greater moisture of the soil (Bowditch and Buchanan) and the diminution of light cannot act favorably. However, on the slope of a wooded mountain, where there is a clear space with free access of air and light, a forest may constitute a favorable element in the climatic condition, especially when the trees are pines.

In regard to desert climate, it is an old observation that the inhabitants of deserts, the Bedouins, as long as they live in tents, remain free from consumption, but that among those of them who live in houses the disease is not very rare. My own inquiries in Egypt and on the peninsula of Sinai led to similar conclusions. From Bedouins who accompanied me on an excursion to Mount Sinai, I learned that as long as they travel no cases of consumption occur, but that some of their relatives who seek a livelihood in Cairo, Suez and Alexandria die of phthisis. I have made similar observations among other wandering tribes who do not live in the desert. Several times in Asia Minor I have met with wandering bands of Turkomans; for instance, near ancient Sardis, the capital of the Lydian monarch Crœsus, I met a large horde, consisting of strong men and women, quite free from phthisis and likewise healthy in other respects. They told me, by means of my interpreter, that members of their horde who had obtained employment in Smyrna and Constantinople had died there of consumption. Possibly, therefore, the immunity from phthisis depends not merely on desert climate but on life in the open air in thinly populated districts.

The characteristics of the climate of the desert are purity of the air, its richness in ozone, great warmth of the sun, abundance of light, dryness, and great rarity of rainfall. The disadvantages are the violent winds, mostly accompanied by dust, which not only obscures the sun like a dense fog, but gets into the clothes, penetrates into closed rooms, and is deposited on articles lying there. These dust storms are not limited to the periodical khamseen

(chiefly in March and April) but occasionally blow from one to three days at any time of the year. Another disadvantage is the absence of shelter, so that one is obliged to have tents and servants, which necessitate great expenditure. One is therefore seldom in a position to test the advantages of the desert, but in individual instances I have seen great benefit derived from it. If sanatoria were to be established near desert stations, the cost for each person would be much diminished.[11]

Egypt is a term which, though often employed in climato-therapeutics, includes very different climates. Egypt is best considered after deserts, because the localities of which therapeutic use is made owe their characteristics mainly to their proximity to the desert. The features which they have in common during the winter months are: (1) Plenty of sunshine; (2) a clear sky in general; (3) a moderately high temperature, with considerable variation between day and night; (4) a low degree of humidity and rarity of rain; (5) a comparatively aseptic air in the thinly peopled districts, an advantage which is wanting in the crowded district of Cairo. The disadvantages are: (1) The well-known strong dust winds; (2) the short duration of the medical season; (3) the return in spring to places with great climatic change; (4) the long journey; (5) the absence of sanatoria. Moreover, the constancy of the meteorological features is by no means so complete as it is reputed to be. It is said that amongst health resorts it is only in Egypt that one may depend on settled weather. After two long visits to Egypt I cannot confirm this belief. Cases for which Egypt has advantages are those complicated with albuminuria, with emphysema, and with frequent attacks of bronchitis; cases with tendency to diarrhœa are to be excluded.

Of the places resorted to by invalids, Cairo is still unhygienic, and only the Ghezireh Palace, which is outside the town and now a large hotel, can be recommended. Mena House, about eighteen kilometres from Cairo, situated at the edge of the desert, close to the Great Pyramids, is only suitable from the end of December to about the end of March; before this time the neighboring delta is still flooded, and afterwards the heat is too great. Helouan, with its well-known baths, which can be reached by a short railway journey from Cairo, is probably at present the best place, because it lies quite in the desert, and can be used during the longest period, from the middle of November to the middle of April. Luxor is a

[11] The latest communication on the climate of the desert is Dr. F. M. Sandwith's Desert Climate for Lung Tuberculosis, Practitioner, June, 1898.

very interesting place to stop at; it consists of hotels and the unhygienic dwellings of the ordinary population. Assouan, the most southern of these places, has much of the exhilarating influence of desert climate, but is very windy, and, owing to the heat, has only a short season—from the beginning of December to about the middle of March. As yet there are no sanatoria anywhere. The patients and the European and American doctors who send invalids to Egypt trust too much to the mere climate without supervision by the medical man, and thus many lives are lost. If there were suitable sanatoria the Egyptian climate could be made good use of. One could prolong the season if one were to erect a sanatorium near Alexandria, preferably at Ramleh, where many patients could stop perfectly well till about the end of May. Inseparably connected with the climatic idea of "Egypt" is the Nile voyage, which can either be made on private ships—the so-called *dahabiyehs*—or on the passenger steamboats, which latter are provided with a doctor. The greatest care is required on these steamboats; colds are very often contracted. The wind is often very violent; a draught can hardly be avoided; the temperature on different parts of the ship—that is, in the sun or in the shade—is always unequal. Private ships are expensive, and the invalid should always have a doctor.

III. CLIMATES OF THE COAST AND OF SMALL ISLANDS; SEA VOYAGES.

Amongst coasts and islands there are, first, the more humid and warm climates, such as Madeira, the Canary Islands, the Peninsula of Florida, and the coast of Georgia and South Carolina, which can be termed sedative, or even relaxing. Formerly, when cold was feared and warmth was regarded as specially beneficial, these climates were much employed, but now they are much less so, though the Islands of Madeira and Teneriffe are suitable for some cases of pulmonary tuberculosis with irritable weakness of the constitution.

Secondly, we have the drier climates with moderate warmth during winter. Amongst these the localities on the Western Riviera are especially popular; they are characterized by the great warmth of the sun, abundance of sunshine, dryness of the air and moderate amount of rainfall, and may be termed stimulant or exciting. Special caution is required on account of the great difference between the temperature in the sun and the temperature in the shade, on account of the sudden fall of temperature before and at sunset, and on account of the frequency of strong winds with

dust. Allied to these climates are those of the Eastern Riviera and of Sicily (Palermo, Taormina, Acireale, Catania), but there is less shelter from cold winds. Algiers and Ajaccio may likewise be compared to them, but they are somewhat moister, and Ajaccio is nearly quite free from dust.

You will understand that on these localities and on many similar ones I must not enter more fully. There is a great want of suitable sanatoria, and the majority of patients trust too much to the climate, and often only seek medical guidance when it is too late. My results here are still less favorable than in the case of mountain climates, but, with careful supervision of the patients, would be similarly much improved. I can likewise not stop to speak of the English seaside places, which have a moderate degree of humidity, and a lower winter temperature. You are aware that till recently well-to-do English, including medical men, showed a great disinclination towards treatment in closed establishments, and that sanatoria and hospitals for the treatment of the poor, though they were not quite so lacking as in other countries, were yet insufficient to meet requirements, but you know also that the struggle against tuberculosis has seriously commenced in England, that to the sanatoria which already exist many new ones will soon be added, and that for those also who possess private means a few establishments have recently been founded.

Of great value are the places on the North Sea and the English Channel in the treatment and prevention of scrofula. They are likewise useful for the prevention of pulmonary consumption in cases of hereditary disposition, but, in my experience, not to the same extent as mountain climates are.

Ocean voyages are not rarely recommended because the following characteristics are attributed to them: (1) Purity of the air; (2) slight range of temperature; (3) abundance of light; (4) constant movement of the air; and (5) mental rest. However, if one examines the conditions of an ocean voyage more exactly, one finds that these advantages are not always completely presented. For instance, the purity of the air is limited almost entirely to the deck, and is generally wanting in the sleeping cabins and the saloons; the pleasant movement of the air is often transformed into a violent storm, whilst in the zones of calm the reverse is the case; the temperature does not vary much from day to day, but on a long sea voyage the oppressive heat of the tropics has to be supported. Hence the treatment of a serious illness on a sea voyage is rendered

difficult by the bad air of the small cabins. I must not pause to discuss the advantages and disadvantages of the different kinds of ships—sailing ships, steamships, wooden ships, iron ships, mixed kinds of ships. Moreover, in respect of the choice between different voyages, I must limit my remarks to mentioning that, to obtain the full effect, one of the longer voyages must be selected, one which lasts about six to sixteen weeks, without including the time spent on land between the voyage out and the voyage home. The best for patients are the voyages to Australia and New Zealand around the Cape of Good Hope (not Cape Horn on account of the great cold), and that to the Cape of Good Hope itself, which in suitable cases may be combined with a stay of several months on the highlands of South Africa.[12]

Of my observations on the influence of sea voyages in pulmonary tuberculosis, I will only give those which relate to the voyages just mentioned, and which lasted from six weeks to seven months. In 70 cases there were 34 showing improvements, 18 showing little change, and 18 showing deterioration. The great majority of the cases were in the first or commencement of the second stage; only 7 were in the third stage.

From what I have observed I would give it as my opinion that sea voyages can do good service in a certain number of tuberculous cases, but that in most such cases other climatic and hygienic methods of treatment exercise at least just as good an influence. If, however, persons of strong constitution, who like sea voyages, develop phthisis under the influence of overwork or mental worry, long sea voyages are to be preferred to all other methods of treatment. A decided advantage of sea voyages is that patients are much more protected from excesses than at many well-known health resorts. Permanent weakness of constitution, very decided tendency to sea-sickness, unalterable dislike of monotonous diet constitute contraindications. Some practical remarks are contained in the article "Ocean Voyages in Phthisis," by Dr. Parkes Weber, in the *Practitioner*, June, 1898, p. 662.

It would be an advantage if there were well-arranged medical ships, a kind of "sea sanatoria," both for long voyages and for short ones—for instance, in the Mediterranean and to the West

[12] On all these points see Dr. Faber's work on the Influences of Sea Voyages on the Human Body, and its Value in the Treatment of Consumption, Practitioner, 1876, vols. xvi and xvii, and 1877, vol. xix. See also Dr. W. S. Wilson's The Ocean as a Health Resort, second edition, 1881. Some notes are likewise contained in my article Zur therapeutischen Verwerthung von Seereisen, Zeitschrift für diätische und physikalische Therapie, 1899, vol. iii, Part 1.

Indies during winter, and in the North Sea during summer, but this will be hard to arrange without great cost to the patients. In the case of rich persons, I have for many years recommended—often with very favorable result—the use of yachts for climatic and hygienic purposes, generally with a medical attendant. Sea voyages can be recommended for prophylactic use against scrofula and also against tuberculosis. Amongst sailors and seafaring persons there is less phthisis than amongst soldiers of the same age on land. Out of 18 boys of very tuberculous families whom I advised to enter the navy, only two became consumptive, whereas amongst their brothers and sisters who chose learned, mercantile, or sedentary occupations, the number of deaths from phthisis was at least three times as great.

IV. BRIEF INDICATIONS FOR THE USE OF DIFFERENT CLIMATES IN DIFFERENT CASES OF TUBERCULOSIS.

(1) It is very difficult to formulate exact rules, partly because tuberculosis occurs in such various forms and with such various complications, partly because the constitutions of the affected individuals are very different. In all our medical work we consider the constitution at the same time as the disease, and in tuberculosis we have to do this very particularly, in the apparently slight cases as well as in the severe ones. First of all, we must be clear as to whether we have to do with a strong or a weak constitution. This is often difficult to tell at first sight, because a naturally strong person may be so lowered in health—partly by the disease itself, partly by preceding unfavorable conditions—that he may seem to have a weak constitution.

In deciding this matter the family history often helps us, not only as to whether the family is free from tuberculosis or not, but still more as to whether the patient belongs to a long-lived or to a short-lived family. If he belongs to a long-lived family, we may suppose that he possesses a strong constitution, even if other members of his family have died of tuberculosis. If he belongs to a short-lived family, we generally have to deal with an originally weak constitution, even if no member of his family has died of tuberculosis. This kind of hereditary tendency—to a long or to a short life—is very important in regard to prognosis and treatment. Another hereditary tendency, which points to a considerable power of resistance, is that towards gout, which to a certain extent is antagonistic to tuberculosis.

Amongst other circumstances which can guide us in forming an estimate of the power of resistance, the personal history may be mentioned. Those persons who from youth up always feel better, are more energetic, can eat better, and put on weight in warm weather, but in cold weather become less capable of work, generally belong to the class of weak constitutions, whereas those who have always done better in the cold possess stronger constitutions. Patients who from childhood onwards have always had high fever with every slight illness, and have recovered with difficulty, and who always have moist hands, must generally be reckoned amongst the weak, erethic constitutions—a conclusion which is mostly confirmed by the color of the skin and mucous membranes, the general appearance, and the weak and irritable action of the heart. If we have come to the conclusion that the patient has a weak constitution, we must be guarded in recommending high altitudes and long sea voyages, and give the preference to warm, sunny and sheltered places, such as Beaulieu and Mentone on the Riviera, and Pau; sometimes Madeira and Teneriffe may likewise be recommended. On the other hand, in strong, somewhat torpid constitutions mountain climates are to be preferred, and occasionally also long sea voyages. In these cases one can do much by keeping them continuously in the open air, by good feeding, and by regulated exercise.

In regard to the following indications the constitution has always to be considered:

(2) In cases with limited disease at one or both apices, without or with an only slight amount of fever, nearly all climates can be made use of, but especially high altitudes and sea voyages if the constitution is a strong one.

(3) Cases with limited local disease and high fever must be at first treated in their houses or in the neighborhood of their homes.

(4) Cases with extensive disease of one lung or of both lungs, without fever or with only slight fever, are more difficult to advise. In the majority of these cases treatment at an only moderate elevation, or at warm seaside localities, deserves the preference.

(5) In advanced disease with fever long journeys should be avoided, and, if possible, neighboring sheltered health resorts, together with careful supervision, should be recommended.

(6) In progressive tuberculosis with scattered foci in both lungs and much fever, sheltered localities near the patient's home, or the home itself, are probably the best places.

(7) In cases of chronic, slowly progressive phthisis I have seen, on the whole, better results from warm winter resorts, and sometimes from sea voyages.

(8) Quiescent cases with extensive damage or cicatrization, are generally better off at only slight elevations, such as Meran, or Arco, or Montreux, or Badenweiler, or on the Riviera or in Egypt.

(9) Cases with albuminuria without fever should avoid high altitudes, and select dry places like Egypt or the Riviera.

(10) The complication of moderate diabetes does not exclude the use of high altitudes, but the latter are injurious in cases with advanced diabetes and emaciation. Similarly, high altitudes should be avoided in cases where the tuberculosis is secondary and the diabetes the primary affection.

(11) Chronic cases with much catarrh require places with as little wind as possible, such as Pau and Arcachon, and, in England, Bournemouth; but in the case of young persons places of high elevation with little wind need not be excluded, and are often even to be preferred.

(12) High altitudes are contraindicated in chronic cases with extensive emphysema; these cases require warm winter resorts, such as Madeira, the Canary Islands, Pau, or places with pine woods, like Arcachon and Bournemouth.

(13) When asthma is a complication, in persons whose idiosyncrasies in regard to localities are unknown, no certainty in the choice of climate is possible; but in the majority of relatively young persons high elevations should be preferred, whilst in older persons moderately warm localities at only slight elevations should be selected, such as Grasse (near Cannes), or Montreux, or Locarno, or Meran, or places amidst pine woods (like Arcachon and Bournemouth).

(14) In all climates for the treatment selection of the dwelling house is of great importance; it should get much sun, should be sheltered from winds and free from dust, and should be built on dry ground; it should be removed from stagnant water and swamps, and from the impure air of factories and similar drawbacks.

(15) For the prevention of scrofula and tuberculosis all healthy climates can be used, as long as a good diet and plenty of time in the open air can be obtained; but high altitudes and marine climates have advantages—the former rather against pulmonary tuberculosis, the latter (including sea voyages) more against scrofula.

(16) The cure of tuberculosis during the early stages is possible in all healthy climates; some climates, however, have advantages for various cases over the other climates; for instance, notably those of high altitude. But climate by itself without careful medical supervision is generally insufficient. The patient's blind reliance on the climate often leads to errors, to aggravation of the disease, and to death. For the majority of patients, therefore, treatment in sanatoria should be preferred, but for the treatment of the poor it is a necessity. The erection of numerous sanatoria for the people is therefore a national requirement for the cure, the prevention, and extermination of tuberculosis.—From "British Medical Journal," June 3, 1899.

THE MALIGNITY OF PALUDISM IN CUBA.

By Dr. JEAN MANUEL ESPADA.*

Of all the diseases that prevail in Cuba there is not one that is more destructive of life than paludism or marsh fever.

Americans are, very justly, most seriously occupied with yellow fever. But can a disease that deals lightly with the natives, that does not attack all foreigners, that often attacks them very lightly and which produces among those attacked with a dangerous disease a mortality of 20 or 25 per cent., and, finally, which is not subject to relapse, be compared with that other disease that respects no one, that attacks all the inhabitants indiscriminately—to-day or to-morrow or later—if the locality possesses the elements essential to paludic fever and which may return ten, a hundred times during a lifetime; that invades the whole organism for an indefinitely long period if not during life; which prepares the way for other morbific agents, which, in fine, constitutes what the ancients called a diathesis, always open for new forms and disposed to aggravate all other intercurrent diseases? No, such a comparison is not reasonable unless it be for the purpose of recognizing the far greater malignity of paludism over yellow fever and even over typhoid fever, dysentery and other diseases that seem more destructive.

But it will be objected: "Examine the statistics and you will find the death rate from marsh fever much less."

*From the "Journal d'Hygiene," June 22, 1899. Translated for THE SANITARIAN by Dr. Corbally.

Here are the statistics for the "maison de santé," *lo Benefico,* of which the writer is the director:

During the year 1898 there were 1,756 patients, either in the acute or chronic form or in the cachectic condition, who were treated in the institution, a figure that represents 35.87 per cent. of the general morbidity. There were, however, only twenty deaths, a mortality of only 1.13 per cent. But these statistics refer only to Havana and not to the country.

Consult the ghosts of the victims of the Cuban war, whether they were Spaniards or Cubans, and fully half a million victims will answer *les fièvre malaria* has caused our death. It will be seen then that, for several reasons, the statistics are far from exact and misrepresent the real condition of sanitation in the island.

A victim of paludism—in other words, of malarial fever—whose power of resisting disease has been diminished, whose constitution has been undermined after an attack more or less protracted, is seized with grippe, with a pulmonary catarrh or an enteritis and dies. The statistician registers the fact, and the report is: Died of grippe, of pulmonary catarrh, of enteritis; but none of these diseases would probably have attacked the patient were it not for the persistent malaria. The real cause of death is therefore ignored.

An abscess of the liver is formed or a schlerosis of the gland exists during an attack of this paludism, a nephritis with albuminuria, an impoverished condition of the blood and similar conditions likely to prove fatal in consequence of previous debility and the inroads made on the constitution; but the statistics will not allude in any way to the real cause of death.

Paludism is no longer considered incompatible with tuberculosis. The contrary is the fact, and the coexistence of the two diseases is well known. The same is true of other diseases, for tuberculosis seems to be a reservoir toward which other diseases flow as affluents.

But the subject must be considered from another standpoint. In all countries that are essentially paludic, all or nearly all the inhabitants are attacked with the disease in a greater or lesser degree. One has the characteristic color of the integuments, in another the digestion is weak; again the liver or the spleen or both at the same time may be enlarged, while others are affected in different ways. Very rarely do we find a person who enjoys perfect health. If occasionally some one is seen who enjoys apparent health there will

always be found something latent in the constitution that indicates the working of the disease.

There seems to be a prevailing opinion that paludism as a disease has been nearly eradicated. Not so. It is in such cases the intercurrent diseases that appear on the surface or the more or less remote effects coincident with the disease that mislead the observer. A powerful influence must be assigned to the action of malaria, whether it is manifested as a new attack or that it exists as a latent element on the appearance of another disease, or, again, that it is fully developed and reacts on some other disease. In all these complex cases paludism is a dangerous host, which sometimes obscures the diagnosis to the prejudice of the patient, influences the prognosis and limits or completely paralyzes all remedial agents.

But to return to the individual whose constitution is undermined by chronic malaria under various forms, sometimes apparently imperceptible, but still real and positive, acting insidiously on the sources and origin of life. Examine the subjects, men and women, whose constitutions are so enfeebled so far as their ability to propagate the species. Their children cannot and never will possess the quantity and the quality of vital energy necessary for their full development.

These facts, pointed out so distinctly by the profession, are worthy of the highest consideration by the public authorities. It is the rôle of medicine to point out the evil and to advise; it is the duty of the administrative authorities to employ recognized means for relief, and, if everything necessary cannot be accomplished in an intertropical climate, at least the ravages of this disease may be greatly diminished.

It must be confessed that curative medicine has only a relative action; not that a cure is always impossible. The majority of the sick get comparatively well, but they still live in an infected locality, and it is evident that immunity does not exist in any case, for it is known that one attack always prepares the way for another until the case becomes chronic unless the patient changes his locality.

Too much must not be expected from medicine in cases in which it is manifestly powerless. Hygiene, with the aid of allied sciences, must point out the remedy. Sanitation, proper drainage, pure water, must save the individual. With medicine alone the problem will always remain unsolved, disease will menace health, and, what is worse, will finally triumph.

SANITATION OF PRISONS.*

By W. H. Blake, M. D., of Wetumpka, Ala.

The housing of large bodies of men, whether they be workmen in factories, soldiers in barracks, or prisoners in confinement, requires the best thought and the most careful attention.

If any one needs more consideration in regard to the hygiene of his dwelling place than another, it assuredly is the prisoner. He is compelled to occupy whatever accommodations the authorities provide for him and to endure whatever condition they may determine. Unlike the pauper or the soldier, he is not allowed to communicate with the outside world, hence it is important that the condition of our prisons should be the best. Dr. Rohe, in his work on Hygiene, says: "The mortality of convicts, even in the best regulated prisons, where especial attention is paid to the sanitary requirements of such buildings, is three times as great as among workmen in mines, confessedly one of the most dangerous occupations." Imprisonment cuts short the expectation of life twenty years. A free man at forty has as long an expectation of life as the prisoner at twenty. Confinement lowers the vital forces and causes the system to yield more readily to acute diseases.

Food should be plentiful, well-cooked and containing proteids, fats and carbohydrates in such proportions as to constitute a healthful diet. The ration for convicts in Alabama is about the same as that furnished by the United States government to its soldiers. Contractors are required to furnish daily to each prisoner three-quarters of a pound of salt bacon, or, in lieu thereof, one-half pound of bacon and one gill of molasses, together with an ample supply of flour or corn bread and vegetables. The bread is given them without limit. Once each day they get coffee and sugar. Once a week each man gets one and one-half pounds of fresh beef instead of his allowance of bacon. They get vinegar and salt, and once a week each man gets one-quarter pound of chewing tobacco. Under the head of vegetables, they get peas, beans, turnips, cabbages and sweet potatoes. We have but little sickness among State convicts that may be attributed to improper diet. Of the total number of deaths for ten years past, 7½ per cent.

* Read at the meeting of the Alabama Medical Association, at Montgomery, April 25, 1899.

includes all that have died from diarrhœa and dysentery, both acute and chronic. Of this 7½ per cent., a safe estimate, based on numerous post mortems, reveals the fact that two-thirds of them were caused by mesenteric tuberculosis. This leaves only 2½ per cent. of deaths from diarrhœa and dysentery other than of tuberculous origin.

The use of water in prisons will next engage our attention. Water is one of the prime necessaries of our existence and ranks next to air in the influence it exercises on the processes of human life. Physiologists teach us that it composes nearly two-thirds of the tissues of the animal body, and that water is constantly being evaporated by the skin, exhaled by the lungs and excreted by other organs. Water is the common carrier that goes to every tissue of the human organism laden with the elements of nutrition; these it deposits, and in turn takes up and bears away the waste products of the body. We should see to it that this element which plays such a constant rôle in our vital processes should not itself be the bearer of the germs of disease. It is too often the case that there is "death in the cup" when its contents are the most clear and sparkling.

Fagge relates that in an English prison whose water supply was from the Thames, dysentery had long prevailed to an alarming degree. The river water was abandoned and the prison supplied from an artesian well. No other change was made. Dysentery disappeared, and for eighteen years only one death occurred in the prison from that disease.

Parkes relates that in 1834 three vessels left Algiers for Marseilles with 800 soldiers, in good health, on board. All three vessels reached Marseilles the same day. On two of the vessels there were 680 men, but not a man was sick. In the third vessel there had been 120 men; thirteen had died during the voyage and ninety-eight of the 107 survivors suffered with paludal fevers. The two vessels exempt from sickness had been supplied with pure water. The vessel on which sickness occurred had been supplied with water from a marsh.

The health record of the town of Selma, in our own State, before and after the use of artesian wells, is familiar to us all. The importance to every prison of a bountiful supply of pure drinking water cannot be overestimated. It should be well aerated; should contain not more than 1 to 1-50 one thousandths of the salts of lime, iron or magnesia, and should be practically free from organic matter.

The water we drink performs the double function of carrying nutriment to the tissues and also of carrying away the debris of broken down tissue. The work of repair is no more important to the health of man than is the removal of the products of waste. "We constantly bear about with us the effete debris of our living selves."

Boucahr has determined that in fifty-two hours a man excretes enough poison to kill himself—that is, that quantity of effete matter thrown off from the healthy body during fifty-two hours if retained would produce death. In this connection the experiments of Dr. Sauquirico, of Siena, are of special interest. They were made in 1887 and published in the medical periodicals of that date. Two sets of dogs and guinea pigs were poisoned with the same doses of strychnine, chloral, alcohol, aconitine, formaldehyde and caffeine. Into one set was injected a saline solution in quantity amounting to 8 per cent. of the animal's weight. The other set was untreated. The results were truly wonderful. The animals into which the saline solution was injected all survived. The others all died. From these facts we are forced to the conclusion that if vegetable alkaloids can be diluted and washed out of the system before their toxic effect is complete, why can not animal alkaloids be treated in the same way as well?

A bit of my own experience is in point just here. Four years ago a highly fatal epidemic of scarlet fever invaded my town. I lost a number of patients, most of them dying from uremic poisoning. I realized that the high fevers must result in a rapid breaking down of the tissues of the body, that the blood was overcharged with the products of waste, and that a failure on the part of the kidneys to eliminate this nitrogenous waste matter was the cause of death. I reasoned that if food were given to patients with high temperatures, that it would be only imperfectly digested, and that that portion of it which entered the blood would not be assimilated, but would only add to the task of the already overtaxed kidneys, whose function was impaired, but on whose continued action depended the life of my patients. In treating subsequent cases I left off giving food to these patients, but gave them water freely from the beginning. This was continued in some cases for several days. Under this management my patients did much better. I confidently believe that these cases show the importance of a free use of water for the solution and dilution of the waste products of the blood.

The State convicts of Alabama suffer very little from those ailments that may be attributed to impure drinking water. For ten years past only 2½ per cent. of all deaths were from diarrhœa or dysentery of non-tuberculous origin. For the same length of time there have been only three deaths from typhoid fever, except at Pratt mines, where there have been eighteen. There has not been a death from typhoid fever at the penitentiary at Wetumpka in ten years. Here the water supply is conveyed to the prison in pipes from a spring about four hundred yards away. At prison No. 4, in Montgomery County, there has never been a death from typhoid fever. There water is supplied from an overflowing artesian well four hundred feet deep.

Authorities all agree that the matter of most importance to the health of people is the air they breathe. "Statistics prove that impure air is one of the most important causes of death." "Of all conditions," says Murphy and Stevenson, "that are prejudicial to the healthfulness of the dwelling, air that has been rendered impure is the most productive of evil." These impurities are of two classes, first, those that have their origin outside the dwelling, such as malaria, noxious gases from slaughter houses, fertilizer factories, etc.; second, that class which have their origin within the dwelling itself. To avoid those impurities originating on the outside, prisons should not be built near marshes or ponds and should be at considerable distance from all manufacturing establishments that are liable to contaminate the air. In the country is preferable, since city air contains ten times as many germs as does country air. Those impurities originating within all occupied buildings deserve most careful attention. The average man exhales from his lungs fourteen cubic feet of carbon dioxide in twenty-four hours. Thirty-two ounces of fluid pass off from his body in the form of perspiration. The whole surface of his body is constantly shedding its epithelium. Lights and the refuse of food add to the impurities. Physiologists are agreed that if carbon dioxide is present in respired air in a greater ratio than 7 to 10,000 it is a menace to health. The laws of hygiene demand that the average individual should be furnished 3,000 cubic feet of air every hour in order to keep the carbon dioxide down to the required limit of dilution. A space of 500 cubic feet per man requires a complete change of air six times per hour. English prisons of modern construction provide 800 cubic feet per man.

The contaminating effect of exhalations from the human body

on surrounding air is only imperfectly understood. In his work on hygiene, published in 1897, Rohe begins this chapter on air with this statement: "Exact investigation into the influence of the atmosphere on health is yet in its infancy."

Dr. Notter, an English authority, says: "In addition to carbon dioxide, man exhales from the lungs organic matter, the nature of which has not been precisely determined. It is odorous, putressible and oxidizable. It yields ammonia, and is therefore nitrogenous. It is doubtless of mixed origin and contains particles of epithelium and fatty matter from the mouth and pharynx, and in some cases organic effluvia from the stomach." Neither has the amount of this complex substance been exactly estimated. It is demonstrated that the pernicious effect of breathing respired air is far in excess of the asphyxia caused by the carbon dioxide it contains. Pettenkofer has found that the carbon oxide in respired air is indirectly a measure of organic impurity from inspiration. What this organic matter is, no one accurately knows; its toxic effect all must admit. In a recent number of the London "Lancet," Dr. Hartley says: "Close rooms and a lack of ventilation are responsible for much more illness than we realize. It was long ago pointed out that certain constituents of expired air are intensely powerful nerve poisons. These considerations should cause us to look on rebreathed air—not as a mere carrier of accidental poisons, but as a poison per se." Du Bois Raymond has denominated this poison anthropotoxine. Dr. Hartley further says: "It is difficult to resist the impression that an overdose of waste products, whether of one's own or other people's, must generally interfere with the metabolism of nerve tissue. It must, I think, sooner or later be recognized that many of the increasing ills which it has been the fashion to charge on the hurry and brain fag incidental to a high state of civilization and a large population, are, in reality, due to the greater contamination of the air we breathe by the waste products of that population. If this be true, the present ideas concerning ventilation must be abandoned as utterly futile, and the need will be felt, not of letting a little air in, but of letting waste products out."

We are all familiar with that feeling of headache and malaise after remaining for a time in an overcrowded church or hall. Is there any abomination more fraught with danger than the overheated, poorly ventilated railroad cars, which every winter makes familiar to us all?

Overcrowding must bring disease. In regard to our prisons, I will venture the assertion there is not a jail in the State of Alabama whose construction provides the cubic space and ventilation demanded for the health of its inmates. The space in the negro department of the Montgomery County jail is 330 cubic feet per man. To furnish the inmates enough air to keep them from becoming poisoned with their own exhalations will require a complete change of the contained air every six minutes. From an inspection of the jail it is evident this is not done. This is only an example of what may be found elsewhere in Alabama. In the Jefferson County jail the space is 355 cubic feet per man. The smallest space in Mobile County jail is 285 cubic feet per man. The individual space where convicts are kept is in many cases too small. At Wetumpka, in the main prison, it is 520 cubic feet per man. At Coalburg the smallest space per man is 350 cubic feet. In the main hospital ward at Wetumpka the space is only 294 cubic feet per man. In the hospital for whites it is only 205 cubic feet, and in this ward consumptives are kept with men sick of other diseases.

The greatest fault in the prison management of Alabama is to be found in construction that does not provide adequate ventilation. The respiratory organs suffer most from a lack of fresh air. Military records show that soldiers are healthier in the field under the rudest shelter than in overcrowded barracks. Dr. J. B. Gaston tells me that, as surgeon in the Confederate army, he observed that when the soldiers slept in tents, consumption was almost unknown, and pneumonia was rare, except as a sequel to measles. Natter tells of the English soldiers that in the Afghan war pneumonia was very prevalent and fatal in the overcrowded barracks, while there was not a single case among those in tents. Distributing the men in tents had the effect of at once stopping the disease. For several years the death rate at Coalburg from pulmonary diseases has been high. About eighteen months ago I decided to ventilate the cells more freely, and accordingly had planks removed from the walls near the ceiling, making a continuous opening all the way round the cells. Since that time the death rate from pneumonia has fallen off 44 per cent. below the average for the three preceding years. For the same time, at the same prison, the death rate from consumption has fallen off 43 per cent. below the average for the three preceding years. No other important change was made in the hygiene of this prison. The time is short for comparisons, but I give you the figures as they are. Consumption brings death to

more convicts than all other diseases combined. Rohe says it causes from 40 to 80 per cent. of these deaths. His estimate is for the United States as a whole. For ten years past it has caused 38½ per cent of all deaths among State convicts in Alabama. In some States the rate is lower, in others higher. Consumption causes more than 50 per cent. of all deaths among the convicts of Texas, and in Tennessee more than 65 per cent.

In Alabama prisons conditions are specially favorable for the development and spread of disease. Not a prison in the State where convicts are confined allows an air space of 600 cubic feet per man. With even that amount of space, hygiene demands that there be a complete change of the enclosed air every twelve minutes. In our prisons, from 50 to 100 men, consumptives, unless acutely ill, are confined together in a single large cell. The results are just what would be expected—a high death rate from consumption and a new crop being prepared all the while to take their places. There is but one course to pursue to meet this condition. It is a complete separation of the tuberculous from the non-tuberculous prisoners, and provide all a more plentiful supply of fresh air.

BABY FARMS.

From the "North American," June 21, 1899.

Humanity and duty dictate that the Philadelphia Board of Health, the magistrates and the police shall soon turn their attention to the "baby farmers," that are as thick in Philadelphia as disease germs in a sewer. Hitherto official eyes have chosen not to see the cruel business that is being done with the bodies of babes as the stock in trade. Official ears have been deaf to the wail of infants abandoned by wanton mothers to the cold care of money-makers.

One of the first matters for the consideration of the new Board of Health will be a recommendation from a coroner's jury that the license of one of these "farmers" be revoked. This is Mrs. Bien, who had an establishment at 948 Franklin street. By the act of a conscientious physician this woman was made to face Coroner Dugan and a jury, and the revolting story of her trade came to light, partly from the testimony of others, largely from

her own lips. Coroner Dugan is positive that the Board will revoke the woman's license. And this is only a case in point. If the Board will only infuse energy into its subordinates it can swiftly lay a destroying hand on a hundred such evil places in the city.

None denies their existence. The police, if they would, could point them out. Scarce a physician, did he not shrink from publicity, but could tell the officials where houses of the character of Mrs. Bien's were thriving. The fact that only twelve licenses have been issued for lying-in establishments by the Health Department, and about as many more permits for "baby farms" by magistrates, simply shows how easy it must be for the rest of them to evade the law.

For evidence of their numbers one has only to look through the advertising columns of certain newspapers in the city to find a long list of advertisers who have batches of babes to give out for adoption.

For a ready insight into the nature of the cruel traffic a review of the case of Mrs. Bien is necessary. On a day not long ago this shrewd-faced creature rushed into the office of Dr. Potsdamer, of 1338 Franklin street, flurried and appealing. Wouldn't the doctor come and see a baby at her house that was sick—very sick? He did. He found a tiny, puny boy dying of congestion of the brain. That is caused by many things—a blow can do it.

Dr. Potsdamer also beheld three other babes, two that were sickly, one that was rosy and healthy. Testimony later showed that money was paid regularly for the fat baby's board. The other two innocents had been left for a round sum with Mrs. Bien, to be disposed of as she saw fit. They hadn't been adopted, and they languished. Witnesses swore that the babies never got exercise or apparently any care at all.

Other physicians besides Dr. Potsdamer asserted that the dead child and the other two showed by their wasted little bodies that the nourishment they got was scant and poor. In fact, they were slowly dying.

And there's the whole story; there is why the wicked business should be stopped. Mrs Bien is probably no worse than the others of her type. These "farms" are founded neither in charity nor morality. They are for the purpose of making money. For money they dispose of the children and cloak the identity of the Magdalens that sneak from the door, deserting their offspring.

From $25 to $50 pays for treatment. From $35 to $50 is the price the mother gives to lose forever the babe whose weak cry is like a ringing curse in her ears. Now the "farmer" makes energetic efforts to get the baby off her hands. She seeks for adopters. Any one will do. She cannot be particular and make money. Perhaps the infant attracts none to befriend it, or rather to take it. Perhaps it overstays the time that it may, and still leave a margin of profit in the pocket of the "farmer." Then what does the "farmer" do? What happens to the babe? It seems that Mrs. Bien was starving the ones in her charge. In the case of Mrs. Nack, who helped Thorne to hack Guldensuppe to pieces in New York, her husband told how she disposed of unprofitable charges on her farm. She choked them to death and burned their bodies.

The Coroner Roused.

Coroner Dugan has seen and heard enough to be stirred to heartstrings against the "baby farmers."

"The whole business is vicious," he said yesterday to a North American reporter. "If such places are to exist at all, it should be under the most rigid scrutiny. But there is, so far as I can see, no use whatever for their existence. They shield vice and, I do not believe, show any conscience in the way they dispose of the children left in their charge. I have my eye on several places that if, by any chance, get before me officially, I will make them sweat. Few of the places are licensed as 'lying-in' establishments. For every one licensed a half dozen exist. I will be glad to help any movement to rout the 'baby farmers' out of town."

Dr. Potsdamer, who revealed the horrors of the Bien "farm" to the police, was also visited.

"This is the second place of this character that I've exposed. I don't want any notoriety, but it won't be the last place. So sure as I find one, I will certainly inform the authorities.

Doctors Are Timid.

"As for the County Medical Society starting a crusade against the 'farmers,' I doubt it, for the society is sick of the law. Some time ago we started out to drive illegal practitioners from the city. We naturally expected the co-operation of public officials. We didn't get it. We succeeded in driving several quacks out of the city, but entirely by our own efforts and at our own expense."

THE MICRO-ORGANISM OF SCARLET FEVER.*

By William J. Class, M. D. (Rush, 1894).

Medical Inspector, Department of Health, City of Chicago; Assistant to Chair of Pathology, Chicago Policlinic; Member Chicago Medical Society, etc.

Scarlet fever being a typical contagious disease, having a period of incubation, it is in accordance with the views of modern medicine to consider as its causative factor a specific micro-organism. Reasoning from this standpoint, a large number of bacteriologists have at different times sought to isolate and establish the identity of the germ in question. Notable among the experiments conducted with this end in view were those of Klein and Crajkowski. Klein in a large number of cases isolated a streptococcus which he considered the causative factor; this germ is also considered by a number of French observers to be the cause of scarlet fever. Crajkowski in 1895 reported that he found in fifteen cases in which he examined the blood of scarlet-fever patients, a diplococcus present in comparatively small numbers, seldom more than one or two in a microscopic field. This diplococcus does not stain by Gram's method and, in general, stains feebly and quickly loses its color, Cultures were obtained in bouillon and upon solid media, but not on gelatin. The development is said to be slow, and the colonies resemble small drops of dew, not more than one-third to one-half of a millimetre in diameter. It is pathogenic for mice, but not for rabbits. Crajkowski does not claim that the etiologic relation of this diploccus to scarlet fever has been demonstrated.

Because of the failure of the various careful scientists who took up this work to find a specific germ either in the scales or in the secretions from the throats of scarlet-fever patients, the writer deduced that the fault lay with the culture media employed, as it is a well-known fact that some germs are very selective in this respect.

Keeping this point in mind a number of experiments were made with different media, including agar-agar, glycerin agar-agar, gelatin, blood serum, bouillon, potato, milk, etc.

*Abstract of paper read at the regular meeting of Chicago Medical Society March 28, 1899.

After numerous failures I finally succeeded in finding a culture medium on which I have been able, almost invariably, to obtain both from the scales as well as from the secretions of throats of scarlet-fever patients, the growth of an organism which presents such characteristic features, both in its morphology as well as in its growth, that I have little hesitancy in stating that in my estimation it is the specific germ of scarlet fever which I am about to describe.

Morphology.—A diplococcus resembling, as ordinary seen on slides made from fresh cultures, a very large gonococcus. This biscuit-shaped appearance is best seen in specimens that have been but lightly stained. In these there is also noted a transverse line running through each half of the organism, giving it the appearance of a tetrad. This appearance is, however, not constant, especially in older cultures, where the organism frequently presents itself as a diplococcus, both segments of which are perfectly globular. The size of the organism also presents a number of variations, but it is always considerably larger than the ordinary pus microbe. The lancet-shaped forms that occur in the pneumococcus are never met with. Usually, unless in spreading the culture on the slide it is rubbed very hard, these cocci occur in bunches of from 10 to 50, which bunching is due to the large amount of glutinous intercellular substance by which they are united. Streptococcus forms are occasionally, though rarely, met with, as are also single cocci. The organism has no capsule, does not show any spores, has no flagellæ, and, examined by the hanging drop, does not show any independent motion.

Staining.—Specimens derived from pure cultures were stained with a number of the anilin stains. With a watery solution of methylen blue very pretty pictures were obtained, especially when only lightly stained; carbol-fuchsin also stains it well, and brings out its characteristics. It also stains with Bismarck brown and with Pitfield's flagella stain. Fresh cultures do not stain very deeply, however, with any of the stains mentioned. It is decolorized by Gram's method, though not to the same extent as the gonococcus—the larger variety of the germ holding the stain better than the smaller.

Biologic Characters.—The culture medium on which this germ grows is prepare as follows: Glycerin agar-agar is made according to the method generally used. To this is added about five per cent. by weight of black garden earth, which has been

rendered sterile by discontinuous heating. The garden earth is first dried thoroughly, then sifted through a very fine hair sieve until it is reduced to a fine powder, all particles of gravel, sand, etc., being removed. It is then mixed with sufficient bouillon to form a thin paste. This is boiled for an hour, enough sterile bouillon being added from time to time to replace that evaporated by boiling; it is then set in a warm place for a few days to allow the spores found in the earth to develop; it is then again boiled for an hour, after which it is again set aside for a few days. This procedure is repeated until no growth can be developed. It is then added to the agar-agar, which mixture is also boiled for about thirty minutes, and then put aside for a few days to see if any germs develop. Should this be the case, the mixture is again boiled and tested as before.

On this medium the scales from a scarlet-fever patient are placed with a sterile platinum loop, and the tubes put in an incubator, the temperature of which is kept at about 35 degrees C. In from forty-eight hours to one week small, whitish-gray, semi-transparent colonies will appear along the track of inoculation, and around the scale. These colonies are isolated at first, but subsequently coalesce. Their diameter varies somewhat, but in general is about 1 mm. On taking up some of the material of which the colony is composed with a platinum needle, it is seen to be glutinous, being drawn out in threads like glue. If the culture medium is dry, or when the colonies are old, they lose their viscidity and become grayer in color.

On agar-agar and glycerin agar-agar there is no growth. On gelatin the result is also negative. Bouillon is not clouded by the germ, and they apparently do not multiply in this medium. On the blood serum furnished by the Health Department for the diagnosis of diphtheria there is a growth, but it is much more meagre than on the culture medium described by me.

The reason why the germ has not been noticed when examinations were made with blood serum is probably due to the fact that other germs, which are always present on the scales, grow so much more abundantly than the diplococcus that the presence of these is overshadowed, while on my medium the diplococcus grows almost to the exclusion of all other organisms.

Milk does not appear to be affected by the diplococcus, although they apparently multiply in it. On potato there was no growth.

Pathogenesis.—Rabbits and guinea pigs were inoculated by subcutaneous injection of a pure culture, by scarification and inoculation of the wounds produced, and by injection into the abdominal cavity, without producing the slightest results. The negative results of the subcutaneous injections show that the germ is no pus producer, at least not in the species mentioned. Other animals are at present being experimented with by the writer and the results will be stated later.

The germ described has been cultivated from the scales of about thirty cases of typical scarlatina; has also been found in the angina of scarlatina and in cases of angina occurring in persons exposed to scarlet fever in whom no eruption showed; and, lastly, I have found it in the throats of children in a family where one member had typical scarlatina, the children being in a normal condition when the culture was made, but subsequently developing a typical rash, in the scales from which I also found the same germ.

In the course of the discussion on Dr. Class' paper, Dr. E. H. Ochsner said:

"I have seen some of the work Dr. Class has done on this subject, and it is certainly gratifying to know that the micro-organism which is the probable cause of scarlet fever has finally been found by a member of the Chicago Medical Society and of our City Department of Health. The work he has done has been very extensive, and while we cannot say positively that it is the real cause of the disease, still everything looks that way. The micro-organism of scarlet fever has been sought by the greatest pathologists for decades, and if Dr. Class has been so fortunate as to find it, he is certainly to be congratulated on so doing.

"The two arguments that are most conclusive to demonstrate that it is the real cause of the disease are, first, he found the organism in the throats of members of the same family where scarlet fever was present, and some of them, who showed no evidences of the disease when the throat secretion was taken, in a few days developed typical cases of the affection. In the second place, the fact that injections of the organism in pure culture cause no pus formation or any septicemic appearances in rabbits or guinea pigs is rather conclusive.

"Of course, all of the principles laid down by Koch to prove that the micro-organism in a certain disease is really pathogenic

have not been demonstrated; but this is not an absolute requirement. Although micro-organisms which we all recognize as specific causes of certain diseases have not fulfilled all of Koch's law, yet we maintain that they are the cause.

"From the examination of the thirty cases described by Dr. Class, one is led to believe, from his painstaking work, that he has really found the specific cause of this disease, and probably he is the first man in this country who has found a specific micro-organism of any importance in this affection, which is certainly worthy of mention and of congratulation."

Dr. Class, in closing the discussion, said: "I do not yet assert that this is the specific germ-cause of scarlet fever. I shall continue my experiments along this line. I have made a large number of control experiments, which I shall give in detail some time in the future."

DEMONSTRATION OF THE ORGANISM.

Subsequently, at the request of the Commissioner, Dr. Class demonstrated the micro-organism in the City Laboratory before the medical members and officers of the Department. Before exhibiting the slides, Dr. Class made the following statement:

"By injecting a culture of this micro-organism into the ear veins of swine I have been able to produce in the animal a disease closely resembling scarlatina as observed in the human being.

"From the blood and scales of this inoculated animal I have been able to cultivate the same species of micro-organism as was originally injected.

"The organism was also found in the fluid portion of the blood withdrawn—occurring, however, in relatively small numbers, while the blood corpuscles themselves were apparently free.

"Judging from this experiment it would appear that the organism conforms to Koch's law as to pathogenicity, and that the chain of evidence is very nearly complete.

"However, as the experiments in this matter have so far been only made by myself and as infallibility is not a part of human nature, it is possible that there is an error somewhere which has escaped my notice. If so, I hope that I will not be censured too severely.

"If what I have stated so far is confirmed I would like to ask Drs. Gehrmann and Wynekoop and my colleagues of the Medical

Staff for their assistance in working out the further problems which will arise in this connection."

At the close of the demonstration Dr. Class distributed a supply of his culture medium and microscope slides of the organism to the members of the Medical Staff selected to conduct the independent investigations.

Photo-micrographs of the diplococcus together with those of staphylococcus and streptococcus were shown.

HYGIENIC VALUE OF PAINTS.—Regarding the effect of various paints upon bacteria, Dr. Heimes has recently ("Farben Zeitung") delivered a notable lecture before the Greifswald Medical Society. It does not appear to be an unimportant matter for the sanitary conditions in a building with what kind of paint the walls are covered. Heimes conducted the following experiments: He took equally large pieces of oak, poplar and pine wood, and of iron and cement plates, and covered each piece with oil paint, size paint, lime paint or enamel paint, as well as with a few proprietary compositions. After the paint had dried perfectly, the plates were coated with cultures of various disease inciting bacteria. In this condition the plates were laid in an incubator, in which an ordinary room temperature was maintained. From time to time a little was scraped off from the surface of the plates in order to examine them as to the amount of live bacteria present. The result was that upon oil paint coatings the bacteria were found to die off quicker than on articles coated with other pigments. On enamel paint the bacteria die more slowly, and still slower on lime and size paint. This heterogenous behavior is probably not due to the chemical properties of the paints, but to the different physical qualities, especially to the fact that the liquids containing bacteria dry more slowly or quickly upon the various paints. Prof. Loeffler, who attended the lecture, attached considerable practical importance to the result, and recommended the use only of oil paint in hospitals, schools, barracks and other buildings.

SOME RESULTS OF DIETARY STUDIES IN THE UNITED STATES.

By A. P. Bryant,
Of the Office of Experiment Stations.

In 1886 the Massachusetts Bureau of Statistics of Labor, under the direction of its chief, Hon. C. D. Wright, began an investigation into the actual food consumption of factory operatives, mechanics, and other people with moderate incomes. The statistics from this investigation were sent to Prof. W. O. Atwater, at Wesleyan University, under whose direction and supervision the results were put in form for comparison with the results of similar studies elsewhere. At the same time similar work was being done by Professor Atwater in the vicinity of Middletown, Conn., with the assistance of students in the university. With the co-operation of Mr. Wright as chief of the Massachusetts Bureau of Statistics of Labor, and later of the United States Department of Labor, with Professor Atwater as director of the Storrs (Conn.) Agricultural Experiment Station, the enterprise became well established, so that in 1894, at the suggestion of the Secretary of Agriculture, Congress made an appropriation to be applied to the study of the food and nutrition of man, which has since been continued. The supervision of this work was assigned to the Office of Experiment Stations, and Professor Atwater was made the special agent in charge. In carrying out its plans the Department of Agriculture has had the co-operation not only of Wesleyan University and the Storrs station, but also of a large number of colleges, experiment stations and social settlements in various parts of the country. In this way a considerable amount of accurate data regarding the nutritive value and relative cost of the diet used by people of different occupations in this country has been obtained.

The part of these investigations which has to do more particularly with the actual food consumption of people may be described as a study of dietaries. The method employed in these experiments is, in brief, as follows: A certain family is found who is willing to allow such a study to be carried on. Just before the beginning of the study an inventory of the amounts and kinds

of food materials on hand is made. Everything edible is weighed, and, in many instances, the beverages, condiments, etc., such as coffee, tea, spices, salt, and vinegar, are also weighed. During the study all food materials, as they are purchased, are weighed and their weight added to the amount of the same materials on hand at the beginning of the study. The cost of the food is also taken into account. The study continues for a certain period (a week, ten days, or even a month) and at the end another inventory is taken of the weights of all food materials on hand. The weight of any material on hand at the beginning added to that purchased during the study, less the amount in the house at the close, gives the weight of that material actually used as food during the dietary study. Not all the nutrients in the food purchased are necessarily consumed. There is a certain amount of table and kitchen waste which, in accurate studies, must be recorded and the amount of nutrients therein determined and deducted from those in the food purchased.

A careful record is kept of the attendance of the different members of the family at each meal and of any visitors who may be present. In this way a record is obtained of the age, sex and occupation of the different members of the family, the number of meals taken by each, and the total nutrients consumed by the family. Of course, the different members of the family will not eat the same amount of food. Not only will the individuals of the same age and sex vary, but women will, as a rule, eat less than men, and young children less than women. Using the best available data, certain factors have been deduced which represent more or less accurately the proportional amount of food different persons will, on the average, consume as compared with an adult man at ordinary manual labor. Thus, it is estimated that a man with severe manual labor will need about 1.2 times as much as the average man at ordinary labor, such as is performed by the carpenter, machinist, mill workman, etc. A moderatively active woman will eat about 0.8 as much as her husband who is at work at some active employment. A man sitting at a desk all day, a bookkeeper, for example, also requires only about 0.8 as much as the carpenter or plumber who is at moderately active manual labor. Children at different ages require from 0.3 to 0.8 as much as the average man.

By use of these factors the total number of meals eaten by the different persons is calculated to the equivalent number of meals

for one man. Dividing this latter quantity by the number of meals per day, usually three, the equivalent number of days for one man is obtained.

From actual analyses of samples of the different food materials used, or from the average composition of these food materials, the actual nutrients in the food eaten are computed, and the results divided by the equivalent number of days for one man give the nutrients per man per day.

The object of such studies as those just described is to determine the kinds, amounts and relative cost of food materials and of nutrients consumed by different classes of people under different conditions of age, sex, health, occupation and environment. It will be noticed that a distinction is made between food materials and nutrients. The term "food materials" is used to designate the different articles of food as they are purchased. The term "nutrients" refers to the particular ingredients in the food materials which serve to nourish the body. These ingredients are chiefly protein, fats and carbohydrates. Protein (nitrogenous material) is required to build and repair the tissues of the body, to make blood, muscle, bone, and brain, and incidentally to furnish energy. Familiar examples of protein are found in lean meat, white of egg, casein (curd) of milk, and gluten of wheat. Fats and carbohydrates are to the body what coal is to the engine. They are consumed in the body to yield heat, to keep the body warm, and to furnish the power required for the internal and external work of the body. Familiar examples of fats are fat of meat, butter and olive oil. Familiar examples of carbohydrates are starch of flour and potatoes, sugar and cellulose or woody fibre. The most convenient way of measuring energy is in terms of heat. The amount of energy furnished by a pound of a given food material, or in the total food consumed by a family, is conveniently measured in calories, just as the weight of the protein consumed is measured in grams or pounds. A calorie is, in round numbers, the amount of heat required to raise the temperature of 1 pound of water 4° F.

The total number of dietary studies made in this country and elsewhere is large, numbering many hundred. Of these, over 200 have been made by the Department of Agriculture in cooperation with colleges, experiment stations, etc., as previously mentioned. Many of these studies have been conducted with the utmost care and thoroughness. They are, however, still too lim-

ited in number and variety to furnish all the information needed about the habits of the people of different occupations and incomes in different parts of the country regarding the purchase and use of food. Nevertheless the work is sufficient to warrant some general conclusions, and it will doubtless be possible to formulate scientific laws of nutrition as the data accumulate from these and other investigations on the food and nutrition of man.

Similarity of Food Consumption Among People Living Under Similar Conditions.

In the following paragraphs some of the results thus far obtained through the studies of dietaries are briefly noted. It is interesting to learn that families in about the same financial condition and performing equivalent amounts of work do not, on the average, differ materially in their food consumption. Of course individual families may differ to a considerable extent from the average, and if we had the individual dietaries of the members of the family we would doubtless find there were still greater fluctuations. For example, in nine dietary studies made among families of carpenters, machinists, etc., in Connecticut, the protein in the food actually consumed varied from 99 to 119 grams, averaging 106 grams, and the energy or fuel value from 2,965 to 3,670 calories, averaging 3,420 calories. In three studies among mechanics in Tennessee the protein varied from 95 to 110 grams, averaging 101 grams, and the energy from 2,820 to 4,090 calories, averaging 3,660 calories. The food actually consumed by a tinsmith in Indiana contained 90 grams of protein and 3,285 calories of energy, and that of a skilled mill workman in New Jersey 100 grams of protein and 3,435 calories of energy. The average of all the mechanics' families studied, 14 in number, showed 103 grams of protein and 3,465 calories of energy in the food per man per day. It is probable that if sufficient data of the food consumption of individuals were available, it would be found that persons of the same age and sex and performing about the same amount of manual labor would, on the average, consume food containing approximately the same amount of protein and energy. A notable exception to this statement is found among the negroes of the South, as shown by the studies made at Tuskegee, Ala. The negroes consume large quantities of bacon and corn meal, both deficient in protein, so that their daily diet is deficient in tissue-building material while furnishing about the same amount of energy as the average workingman elsewhere has in his food.

A similar deficiency may exist in the dietary of many white people of limited means in the South, especially in the mountain regions, where their diet is quite similar to that of the negro.

It has been shown that people at hard work consume considerably more food than people engaged in sedentary occupations. As illustrations of this fact, several dietary studies may be cited. The first was of a builder's family in New York City. The husband was a very large and strong man, who, it was said, could perform the work of about two ordinary men. His wife was also large and active. The average food consumed per man per day by this family contained 195 grams of protein and 5,955 calories of energy. In the family of a blacksmith residing in Middletown, Conn., the food consumption per man per day amounted to 100 grams of protein and 3,640 calories of energy, and that in a carpenter's family in the same place to 101 grams of protein and 3,365 calories of energy. The family of a teacher in Lafayette, Ind., having a comparatively small amount of muscular exercise, consumed food furnishing 106 grams of protein and 2,780 calories of energy per man per day. These examples illustrate the difference in food consumption by people with different amounts of labor.

Effect of Change of Location on the Dietary.

As a result of dietary studies carried on among families of foreign birth or parentage in Chicago, it was found that they continued to a considerable extent the dietary habits learned in their native countries. All the different nationalities quite generally patronized markets kept by their own countrymen and purchased the kind of food materials to which they had been accustomed. The Italian families cling to the use of macaroni and oils, wines and cheese, because they were accustomed to them in Italy. They use little milk, and have little idea of the value of American vegetables. Macaroni, which forms one of their chief articles of food, is now made in this country, and forms a nutritious and fairly inexpensive article of diet. The oil, wine and cheese are largely imported, and hence much more expensive here than in Italy. They seem to be actually in dread of American foods, instead of taking pains to adapt their tastes to foods which are easily and cheaply secured. Among the families of Russian Jews it was noticed that the orthodox class held firmly to the ecclesiastical laws governing the mode of slaughter of animals for food, and that even among the unorthodox few had overcome their an-

tipathy to pork, and this article of diet appears to be very little used among them. It was found, however, that extended residence in this country gradually produced changes in the food consumption, so that the families born in this country of foreign parents did not seem to differ materially in their food purchases from other native Americans in the same region.

Dietary Studies in Farmers' Families.

A dietary study was made of a farmer's family in Vermont. It was in winter, and the family lived at such distance from available markets that it was not always convenient to obtain fresh meats; consequently the amount of such food used was small as compared with that found in the ordinary dietary. The vegetable foods were largely those produced on the farm. Large amounts of flour, corn meal, potatoes, beans and onions were used, together with crackers, sugar and molasses. The total protein in the food amounted to only 69 grams and the energy to 2,960 calories per man per day. A dietary study of this same family in the summer, when all were engaged in rather active exercise and the markets were perhaps more accessible, showed not only an increased food consumption but a larger proportion of meats. The food consumed per man per day then furnished 89 grams of protein and 3,300 calories of energy. In general, it may be said that, as compared with corresponding studies of people with a moderate amount of work living in towns and cities, the diet furnished an excess of fuel ingredients (carbohydrates and fat) in proportion to tissue-building material (protein). The average of ten dietary studies among farmers' families, chiefly in Connecticut, shows that the daily food furnished 97 grams of protein and 3,915 calories of energy per man; rather less protein and more energy than have been found in the average food consumption of the carpenter, machinist and blacksmith. This same difference is found in the diet of the farmer as compared with professional men. The teacher living in a large town or city consumes on the whole rather more meat and less flour and vegetables than his friend on the farm. This difference in food habits is largely due to difference in the opportunities for the purchase of food. People living in towns have a much wider range of choice than those in the country, especially as regards meats. On the other hand, owing to the abundance of vegetables, grains and other farm products, and the difficulty of obtaining fresh meats in

convenient quantities, the farmer's diet is apt to be deficient in nitrogenous foods as compared with the food consumption of other classes of people. Whether this is a disadvantage physiologically, is a question that cannot be definitely answered at the present time. It would seem that a larger proportion of protein would be desirable. This deficiency could be readily made up by consuming more eggs, milk and cheese.

Dietary Studies Among Mexicans and Negroes.

Another illustration of the fact that the most available food supply usually determines the dietary habits is afforded by dietary studies made in New Mexico and in the Black Belt of Alabama. It was found that Mexicans living on the ranges of New Mexico consumed very little meat, and that the food consisted almost entirely of flour, corn, chili pepper, and legumes raised at home. The average food consumption of four families residing in this region showed 94 grams of protein and 3,550 calories of energy, results agreeing very closely with those obtained in studies of the Eastern farmer, although the cost of the food in the case of the Mexicans was much smaller, amounting to but 7 cents per man per day. The negro in the South is accustomed to living upon a very simple and inexpensive diet, consisting of food materials which will keep almost indefinitely in a warm climate without deteriorating. The diet is largely made up of bacon and corn meal, and the amount of protein furnished is very small compared with the energy. In this case there can be no doubt that the diet is one-sided.

It is interesting to note that in negro families who had come more or less under the influence of such educational institutions as those at Tuskegee, Ala., and Hampton, Va., the diet became more or less modified. To illustrate, a family which may be regarded as typical, living on a plantation in Alabama and coming in no way under educational influences, had a diet consisting of fresh pork, bacon, buttermilk, corn meal and sugar. This diet furnished 52 grams of protein and 3,235 calories of energy per man per day. Not very far away there lived another family, two of the members of which had come under the influence of the Tuskegee Institute. The diet here consisted of bacon, eggs, milk, butter, wheat flour, corn meal, sugar and molasses. The food per man per day furnished 92 grams of protein and 3,270 calories of energy, or nearly twice as much protein and the same energy

as was obtained by the preceding family. In the outskirts of Tuskegee lived a colored carpenter who had learned his trade at the institute and was quite skillful. His diet contained beef round, mutton leg, bacon, lard, chicken, eggs, butter, milk, wheat flour, corn meal, rolled oats, sugar, molasses, evaporated apples and strawberries, a diet as varied as is found in many families in comfortable circumstances in other regions. The food furnished 97 grams of protein and 4,060 calories of energy per man per day. These results show more energy than is usually found in the food consumed by persons at moderate labor. The protein compares quite closely with that found in the diet of the average mechanics' families. The larger amount of energy is due perhaps to the fact that more muscular work was performed.

Animal and Vegetable Foods in Dietaries.

Different food materials differ widely in the kinds, proportions and amounts of nutrient ingredients they contain. It is customary to group these materials into two general classes, animal and vegetable foods. The animal foods, such as beef, veal, mutton, pork, fish, poultry, eggs, cheese, etc., contain, as a rule, little or no carbohydrates. Exceptions to this rule are chiefly found in milk and products manufactured from milk. With the exception of butter, lard, and all but the leaner cuts of pork, animal foods are essentially a source of protein rather than energy. In such materials as veal, young chickens and fish there is almost no fat, protein being practically the only nutritive ingredient. The presence of animal food in the diet is due not only to custom and desire for variety, but also to the fact that with most people it is one of the most important sources of protein or tissue-forming material. At the same time animal foods are more expensive than a large number of the vegetable food materials. Among vegetable foods we usually distinguish between cereals and their manufactured products, sugars, starches and the like, vegetables and fruits. Of these subclasses the cereals are most important. The cereal foods (corn, wheat, barley, buckwheat, etc.) and their manufactured products (flours, bread, crackers, etc.) not only furnish a very large proportion of the actual nutrients in the ordinary diet, but furnish these nutrients most economically. Ten cents expended for wheat flour or corn meal will purchase a much larger amount of nutriment than if expended for any other food material, unless it be dried beans and peas.

With the exception of a few of the more common vegetables, such as potatoes, turnips, beets and onions, the green vegetables and fruits, such as cabbage, lettuce, squash, string beans, tomatoes, apples, oranges, bananas, strawberries, etc., contain a comparatively small proportion of actual nutrients. Their value in many cases lies not so much in the actual amount of nutrients they contain as in the variety and palatableness they give the diet, and in the organic acids and the mineral matters they contain. When used in considerable amounts they largely increase the cost of the food while adding comparatively little to the actual nutritive value of the diet. As an illustration of this latter statement, the case of a skilled mill workman in New Jersey may be cited. The number of meals taken by the different members of this family during the study was equivalent to one man one hundred and twenty-seven days, or practically four months. During this time $2.16 was expended for oranges and $3 for celery, making a total of $5.16 for these two articles, which between them furnished 150 grams of protein and 6,445 calories of energy. During the same time $5.16 was also expended for cereal foods and sugars, and 3,375 grams of protein and 184,185 calories of energy were obtained, or about twenty-five times the amount furnished by the oranges and celery. The amount expended for vegetables and fruits aside from the oranges and celery amounted to $5.75, and furnished 1,909 grams of protein and 58,000 calories of energy, or, in round numbers, ten times as much as was obtained in the oranges and celery.

Some Effects of Different Combinations of Food on Dietary.

Results of dietary studies show a great difference in the kinds of cereal foods, meats, vegetables and fruits purchased by different families, so that one family may obtain more nutrients for the same money or the same amount of nutrients for less money as compared with some neighbor. Dietary studies were carried on in the families of a teacher and of a tinner living in Lafayette, Ind., during the spring of 1895. An examination of the details of the two studies shows that the teacher obtained per man per day 75 grams of protein and 1,425 calories of energy at a cost of 12 cents; the tinner, 62 grams of protein and 1,640 calories of energy at a cost of 13 cents. In other words, the actual nutritive value of the diet was not notably different in either case. The proportion of beef, veal, eggs, etc., in the two diets was, however, quite

different. The teacher's family used large amounts of beef, round and shoulder, and some loin steak, which was purchased at a low price. The tinner's family used rather less beef, but the cuts that were used were, on the whole, more expensive. The teacher's family used more veal, which was relatively costly; less eggs, more than twice as much milk, and less butter than the tinner's family. On the whole, the former got a little more protein and a little less energy than the latter in the animal foods purchased.

However, the great difference in the two dietaries lies in the kinds of cereal foods purchased. The teacher's family had home-made bread and cakes, while the tinner's family bought bakers' bread and occasionally cakes. The former obtained his bread at about half the cost to the latter, even when a reasonable allowance is made for the cost of all the ingredients in the bread and the heat required to bake it. The teacher's family used more cereals and less vegetables and fruits than the tinner's family. In these ways the former family obtained in their vegetable foods 36 grams of protein and 1,485 calories of energy for 6 cents per man per day, while the latter spent more than twice the amount (13 cents) per man per day and obtained 44 grams of protein and 2,200 calories of energy. In other words, the teacher obtained for 18 cents as much protein and nearly as much energy as did the tinner for 26 cents.

Desirability of Considering Nutritive Value in the Purchase of Food.

The circumstances of some families are such that they can afford the higher-priced meats and the costlier vegetables and fruits, while other families have to calculate closely in order to make both ends meet. The man with an income of $5,000 a year can pay 25 or 30 cents a pound for his steak and buy large amounts of celery, oranges, etc., but the man with an income of $500 a year can ill afford such expenditures. In such cases it is frequently of the greatest importance that the purchases of food shall be guided rather by the amount of nutrients they will furnish than by their palatability or bulk. It has been found that the inexpensive foods are often as nutritious as the costly; in fact, cost is not regulated by nutritive value. Skill in preparing food will render many inexpensive articles very appetizing while the most expensive articles are often ruined by poor cooking.

Examples of the effects of the lack of knowledge of the value of

different food materials for nutriment were shown in some results obtained in the study of dietaries among families in New York City. In one instance a family depending more or less of the time upon charity consumed food furnishing 40 per cent. more protein and 16 per cent. more energy than is found in the average diet of the mechanic with an income of $2 to $3 a day. In another case the total income of the family, consisting of the father, mother and five daughters, the oldest 21 years of age, was about $24 a week, but through carelessness and ignorance they were insufficiently nourished. At the time of the study they were obtaining 85 grams of protein and 2,235 calories of energy per man per day. The diet was afterwards changed for the better, and a few months later the family had greatly improved in health.

Nine cents a day is a very small allowance for a man at moderate work, and yet several instances have been observed in connection with the dietary studies made in this country in which the food per man per day has been purchased for this sum or less. A family living in New York City may be cited. The daily food of this family furnished but 54 grams of protein and 1,500 calories of energy, less than half the protein and energy found on an average in the diet of a man in more comfortable circumstances. Even with this small sum the family might have fared much better had the mother known more about the nutritive value of the different foods. For instance, they might have used more wheat flour and less cake. As a matter of fact, a mill workman's family in Pittsburg, for the same sum, obtained 77 grams of protein and 2,440 calories of energy per man per day. In other words, they obtained 50 per cent. more nutrients for the same money and the diet seemed equally palatable. Similar cuts of meat were bought more cheaply and other cuts were selected which cost but half the price per pound that was paid by the New York family. All vegetable foods were purchased by the Pittsburg family at a smaller price per pound. Stale bread was also purchased for 2.5 cents per pound that actually furnished more nutriment, pound per pound, than the fresh bread purchased by the New York family at 4 cents. The results of a considerable number of dietary studies made among families with very limited incomes in different parts of the country indicate that through ignorance of the real nutritive and pecuniary value of different food materials either more is spent for food than can well be afforded or the family is insufficiently nourished on the sum expended. Often a con-

siderable sum is wasted by purchasing food in very small quantities.

Many people have the impression that milk is an expensive food. In some instances this is undoubtedly true. At other times its introduction into the diet in larger amounts than customary may actually serve to lessen the cost of food. In a series of dietary studies made at the Maine State College the experiment was tried of allowing a free consumption of milk, of substituting milk for other foods, and finally of reducing the amount allowed each man. It was found that the cost of the diet was slightly greater when the milk supply was limited, and that the unlimited use of milk actually made the cost of the diet a trifle less. The amount of other foods was reduced as the amount of milk was more liberal. It should be said that these changes were not marked enough to render the diet unpalatable in any case.

Importance of Avoiding Waste of Food.

In all that has been said thus far the term food consumption has been used. The food actually consumed is usually less than the food purchased, owing to waste in the kitchen and on the table. By the term waste is not meant the inedible portions of the food materials, such as bone, tendon, vegetable parings, etc., unless these are very large in proportion, but those portions of the food which, though edible, are thrown away. The actual amount of such waste varies greatly in different families. In some cases investigated it has amounted to practically nothing, and in other cases it has been nearly one-fifth of the total food purchased. Generally speaking, the amount of waste has been found to be greatest in those families who can best afford it. This is not always the case, however, and occasionally an unusually large portion of waste has been observed in the diet of those who can least afford it. This is illustrated in the diet of the family in New York previously referred to. As stated, they had only about one-half the amount of nutrients found in the average diet of the man at moderate work, and yet nearly 6 per cent. of the total food purchased was wasted. The average waste found in fourteen mechanics' families in such circumstances that they were not necessarily restricted in their choice and use of food, amounted to 6 per cent. of the total nutrients purchased; that in professional men's families to a little over 3 per cent. It is of interest to note that, while the professional man was paying 28 cents per

day for his food and the mechanic 19 cents, the former only wasted half as much as the latter.

Ways in Which the Results of Dietary Studies May Be Used.

Some of the more important and more noticeable results of dietary studies have been noted in the preceding paragraphs. How can these results be applied to the benefit of the individual, the class, or the human race? There are many ways in which this can be done. Perhaps one of the most important of these is in instruction concerning the nutritive value of the different food materials and their pecuniary economy. People should be taught how to improve their diet by the economical purchase of those materials best adapted to their physical needs. It will be found that by exercising care in the purchase and preparation of food a palatable and relatively inexpensive diet may often be obtained. Much is already being done along this line in many of the large cities, where the cost of many food materials must always be relatively large.

When the true character of the different kinds of food materials is more thoroughly understood diet will almost of necessity become more rational. With the advance of knowledge as to the physical requirements of the body it will become possible to establish standards which shall indicate the approximate amount of the different nutrients required. By this it is not to be understood that any definite rules for the consumption of food can be laid down, but simply that it will be possible to furnish a reliable guide for the purchase and use of foods.

The proper nourishment of the inmates of institutions where large numbers must be fed, such as schools, reformatories, prisons and hospitals, is a subject that is attracting no little attention at the present time. In several instances studies have been made of the actual food consumption in such institutions, and at the present time an extended study of the food requirements of the insane is being carried on by one of the States. In many instances dietary studies have been made in schools, college clubs, etc., and the information obtained has been of much use. That such studies have been found to have a practical value and that the interest in them is widespread is shown by the fact that a considerable number have been undertaken by instructors and others interested, aside from those carried on by the Department of Agriculture.

When it so happens that large bodies of men are to be fed, as in

the case of armies, or where the transportation of large amounts of food is difficult, the results obtained from dietary studies and similar investigations are of the utmost advantage in the selection of the food ration. It also becomes possible to select condensed rations which for emergencies shall furnish within the smallest space sufficient food for sustenance.

These are some of the more important uses that can be made of the results of dietary studies and similar investigations. They are sufficient to show the advantage to be obtained from extended research in this direction. At present only a beginning has been made, but every year adds to the data obtained.

In general, the object of dietary studies is not to limit the amount or variety of food to be used by the people, but rather to discover ways and means in which their dietaries may be improved and the available food supply be most economically used to maintain the body in good health and to make it an efficient instrument for the different forms of labor required by our complex civilization.

It is not the purpose of food chemists to prescribe weighed amounts of different foods as a physician prescribes medicines, but rather to show the actual nutritive value of different food materials and their relative economy as sources of nutrients, leaving the application of the knowledge to individuals. Although dietary standards are suggested, it is not necessary that the food each day should contain exactly the kind and amounts of the different nutrients required by the standards. A slight deficiency one day will be made good by an excess the next, the body serving as a storehouse for reserve material. Experience has, however, shown that the body is best nourished when through long periods the food approximates the requirements of the so-called standards. Individual requirements and individual peculiarities will always affect the choice of foods. In the purchase of other things their value for the purpose for which they are intended is considered as well as their cost. Without doubt the same principle may be advantageously applied to the purchase of food. By the exercise of a wise economy, based on a knowledge of the real nutritive value of foods, a more satisfactory diet can be obtained for a less sum than is at present expended in many cases, or the cost of the diet may be diminished without lessening its nutritive value.—From the Year Book of the Department of Agriculture, 1898.

ALCOHOL AS A FOOD.

By Prof. H. W. Conn, of Wesleyan University, Middletown, Conn.

A partial truth is sometimes more misleading than complete ignorance, or, indeed, sometimes more so than slight misstatements. An illustration of this is seen in the erroneous inferences that have been widely drawn from the reports of recent experiments upon the relation of alcohol to the human body which have been carried out in this university. The alcohol problem is certainly one of the greatest of present day problems. The injurious effects of this substance upon the human race probably surpass those of any other evil, and for this reason the question is ever coming up afresh. The problem is a very broad one, with many sides. Moral questions, psychological questions, sociological questions and political questions are bound up in the subject, until it is clear that the development of civilization is closely dependent upon it. So much has been said upon these topics and the facts are so clear that their very familiarity tends to dull our appreciation of them. These are certainly the most important aspects of the alcohol problem. A series of secondary problems concerns the physiological effects of alcohol on the body. But even this secondary questions has its many sides. Alcohol has an effect upon the circulation, upon the digestion, upon the excretion and upon the nervous system, and lastly, it has certain relations to the problem of assimilation and use by the body. It is only the last one of these questions that has been touched by the recent experiments. The well-known Committee of Fifty has undertaken to organize investigations upon the various aspects of this important question, and, if possible, to reach conclusions that shall be free from prejudice. Manifestly, if conclusions are drawn from one small aspect of the problem without consideration of others, the results will be perhaps farther from the truth than before.

Now it chances that one phase of this broad subject has been investigated in the laboratories of Wesleyan University, and certain conclusions have been reached, or rather, let us say, certain facts have been demonstrated. These facts are in a measure contrary to certain statements that have become current in temperance teaching.

It has been shown that when alcohol is taken in small quantities by certain persons, it is oxidized in the body and gives rise to heat and energy just as starch would, and is, therefore, a partial food. It must be noticed that it has been distinctly denied that it is a complete food, and stated that it cannot replace body tissue. But the experiments have been immediately seized upon by newspaper sensationalism and interpreted to mean that the use of alcohol in these small quantities is perfectly safe, and is, perhaps, to be recommended. The fact that it may thus be a partial food is taken to mean that it is a complete food, and in general the inference is drawn that physiologically alcohol is not injurious. Now nothing could be a more woeful misconception of scientific experiment. A physicist could experiment with gunpowder and prove that it is easily oxidized and gives rise to a large amount of heat and energy. From this it might be argued that gunpowder is a most useful kind of fuel for cooking stoves. Such a conclusion would be hardly less logical than the conclusions that have been drawn from these experiments with alcohol, and which regard it a useful food for the body. Gunpowder is a very unsafe fuel because of its secondary effects, and in the same way the food value of alcohol cannot be determined by its power of being oxidized, but must include the consideration of its secondary effects as well.

To show how misleading such a conclusion may be we may notice a single aspect of the question: Alcohol is oxidized in the body and gives rise to heat. Moreover, the use of alcohol, as is well known, produces a flush of the skin and a feeling of warmth. These two facts will convince most people that alcohol is a heat producer. But when looked at more closely the question is not so clear. The flush of the skin is due to the action of alcohol upon the nervous system, which causes a paralysis of certain nerve centres, resulting in the dilation of the blood vessels in the skin. This dilation causes the blood to rush rapidly through the skin, giving a sense of warmth to the end organs located in the skin. But at the same time the blood, as it rushes through the skin, is rapidly cooled by the radiation of heat, this method being, indeed, that which the body uses to reduce its heat. It is like opening the windows of a warm room to let the heat out. The opening of the window does not warm the room, even though a person seated just outside might feel more heat coming from the room, and hence think it were warmer. Now, the flushing of the skin which follows alcohol drinking signifies the opening of the window due to a partial par-

alysis of certain nerve centres. Clearly, then, the question whether alcohol is a heat producer or a heat reducer is simply the question whether more heat is lost by the increased radiation from the skin when the windows are opened than is produced by the oxidation of the alcohol which has caused them to open. Probably no one can state to-day whether the extra heat lost is greater or less than the extra heat produced by the alcohol oxidation, but it is evident that the simple statement that alcohol is oxidized and gives rise to heat is only a part of the truth, and may be absolutely misleading.

Our teachers of physiology make most contradictory statements concerning the physiological effects of alcohol. It is said to be a food; it is said to be a poison. It is said to be a heat producer; it is said to be a heat reducer. It is said to be oxidized; it is said to be excreted without oxidation. It may seem strange that such contradictory statements are possible. But the reconciliation is not difficult. The early experiments, upon which one class of statements is based, were made with the use of alcohol in large doses, while the later experiments, which form the basis of the other class of statements, have been made with small doses. In large doses there is no doubt that the effects of alcohol are abnormal. It reduces temperature; it has injurious effects upon digestion; and, most important of all, it paralyzes the nervous system. This paralysis shows a wide range of completeness according to the amount of alcohol and the peculiarities of the individual, but it affects nerves, spinal cord and brain alike, and when one is completely drunk the whole nervous system is almost completely paralyzed. When this condition occurs the whole organism is deranged and alcohol deserves the name of a poison which is given to it. But, on the other hand, when used in small quantities the effect is different. It may then be oxidized and furnish heat and energy without apparently producing secondary abnormal effects. Based upon experiments with small quantities, the statement is made that it is a food, and herein is the reason for the contradiction of statement.

But to state that alcohol in any quantity is safe is a woeful misinterpretation. No one can yet state at what point the secondary injurious effects begin, and no one can state what is a small and what a large dose. Further than this, it is certain that as commonly used by the American people it is not used in quantities so small that its secondary abnormal effects are not produced. As commonly used by our people its action becomes abnormal, and there is thus considerable justification for the name of poison which is

applied to it. Alcohol is not used as a food. It is used always for its influence upon the nervous system, and one of the well-known results is that, at least among Americans, the use of alcohol in small amounts is almost sure to pass speedily into its use in larger quantities. When used in quantities sufficient to produce a flushed skin it is pretty safe to say that its secondary abnormal effects have begun.

But, after all, the question of whether alcohol in small quantities may be oxidized in the body is only a very small part of a very large subject. Our general teaching upon the subject will hardly be affected by this particular aspect of the problem. The evil effects of alcohol upon the race are great, and are to-day recognized hardly less among the European nations, although they use it almost universally, than in this country, where there is more total abstinence. But these evil effects have absolutely nothing to do with the question of whether alcohol may be oxidized in the body. They are primarily dependent upon the normal effects, whose seriousness can hardly be overrated. They are dependent only secondarily upon physiological factors. But even of these physiological effects only a very small part is involved in the question of whether alcohol should be called a food or a poison. The physiological effect of alcohol is a broad question, involving many other factors than those of being oxidized and yielding heat, and it is very unfortunate that our temperance text books have placed such stress upon this comparatively unimportant aspect of the alcohol problem. Until the results of the more careful experiments upon other phases of the subject are given we cannot make any safe conclusions as to the physiological effects of alcohol, except to confine our statements to simple facts. One of these simple facts is that, under certain conditions, alcohol is oxidized in the body. Let us not be afraid of the truth, but let us be careful not to make it possible to draw wide and unjustified conclusions from experiments which cover only a very small part of a very large subject.—From "The Christian Advocate," July 13, 1899.

A REPROOF.—A young fellow in a coffee house venting a parcel of commonplace abuse on the clergy, in the presence of Mr. Sterne, and evidently leveled at him, Sterne introduced a panegyric on his dog, which he observed had no fault but one, namely, that whenever he saw a parson he fell a-barking at him. "And how long," said the fellow, "has he had this trick?" "Ever since he was a *puppy*."

LEAD POISONING FROM DRINKING WATER CONVEYED THROUGH LEAD PIPES.

The Massachusetts State Board of Health, in a recent communication to the Lowell Board of Health, calls attention to the danger from lead poisoning in Lowell by the use of lead pipes in houses in connection with the driven well system:

"Office of the State Board of Health,

"State House, Boston, June 29, 1899.

"To the Board of Health of the City of Lowell:

"Gentlemen—The State Board of Health has recently made investigations in the city of Lowell with reference to the action of the water of the public water supplies of the city upon the service pipes through which the water is supplied to consumers, a large proportion of which, it appears, is of lead.

"In the course of these investigations many samples of water have been collected from lead service pipe in various parts of the city, and the results of the analyses have shown the presence of lead in all cases where the water has been drawn through pipes of that metal, and in many cases the quantity of lead present has been found to be dangerously large.

"In connection with this investigation, information has been collected from about one-fifth of the physicians in the city, who report about 40 cases of lead poisoning, some of which are of very serious character, all of which have occurred within the last five years or since the introduction of well water. Wherever practicable samples of drinking water supplied from the house faucets in the houses of persons suffering from lead poisoning have been collected and analyzed, and the results in all cases have shown the presence of lead, generally in large quantities.

"The ground waters in the State, which take lead from pipes, are found to contain an excess of carbonic acid, and the waters from the Cook and hydraulic wells are found to contain more carbonic acid than any other water supply in the State. The water from the boulevard wells contains less carbonic acid than from the Cook and hydraulic wells, and somewhat less than the water in other places where lead poisoning has become serious.

"At the time of the examinations a part of the city was supplied with water from the Cook wells, mixed with a small amount

of water from the hydraulic wells, and the remainder with water from the boulevard wells. Both waters attack the pipes, and sickness is found in houses supplied from all the sources, though the water of the Cook and hydraulic wells appears to take up a larger quantity of lead from the pipes than the water of the boulevard wells.

"The investigations made by the board are not complete, but they have been carried far enough to show definitely that great injury is being done to the health of a large number of people in the city of Lowell by the use of water for drinking and for cooking which is drawn through lead pipes.

"By boiling the water the lead is not driven off, but may be concentrated so that the use of boiled water in making tea, coffee, etc., and in cooking may result in as serious injury as the use of the water directly for drinking. If the water is allowed to run freely before using the quantity of lead taken up will be less than when the water is allowed to stand in the pipe for a considerable time, but even when allowed to run freely it may contain a sufficiently large quantity of lead to produce serious injury, and the only way in which safety can be insured is by removing all lead pipe which conveys water used for drinking or for cooking and replacing it with a pipe which will not be attacked by the water, or if attacked, will not be liable to injure the health of those who use the water.

"The other examinations of these waters drawn through galvanized iron pipe show the presence of large quantities of zinc, so that the coating of zinc is not likely to protect the pipe for any considerable length of time.

"The indications are that if pipes of plain wrought iron should be laid, while no injury would be done the health of people using the water, large quantities of iron might be dissolved from the pipes, rendering the water unsatisfactory. Pipes made of tin, or of lead, lined with tin, could be used with safety for service pipes, and pipes of iron lined with cement, where the work was thoroughly done, would also be satisfactory.

"By order of the board,

"SAMUEL W. ABBOTT, Secretary."

The announcement from the State Board of Health was a disagreeable surprise. The impression among men who have been watching the different water supplies there for years has been that filtered Merrimac river water will be the best.

There had been talk that the driven well water was too hard for people suffering with kidney trouble, but no one suggested the greater liability of lead poisoning by the use of driven well water conveyed by lead pipes than water from other sources conveyed by the same means. And it is thought singular by some of the citizens of Lowell that the attention of the local board of health was not called to this danger by the physicians of the city.

But the duty of knowing and using such knowledge pertained to the Board of Health.

REGULATIONS FOR THE PUBLIC SAFETY.

By the State Board of Health of Massachusetts.

APPLICABLE TO THE WHOLE COUNTRY.

In view of the unusual prevalence of smallpox, in this and adjoining States, the State Board of Health desires the attention of the citizens of Bridgewater (where smallpox is prevalent) called to the existing statutes relating to smallpox and vaccination.

Acts of 1884, 1890, 1891.

When a householder knows that a person within his family or house is sick of smallpox, diphtheria, scarlet fever, or any other infectious or contagious disease dangerous to the public health, he shall immediately give notice thereof to the Board of Health of the city or town in which he dwells, and upon the death, recovery or removal of such person, such of the rooms of said house and such of the articles therein as, in the opinion of the Board of Health, have been subjected to infection or contagion shall be disinfected. Any person neglecting or refusing to comply with either of the above provisions shall be punished by a fine not exceeding one hundred dollars.

Acts of 1891.

When a physician knows that a person whom he is called to visit is infected with smallpox, diphtheria, scarlet fever or any other disease dangerous to public health, he shall immediately give notice thereof in writing over his own signature, to the Board of Health;

and if he refuses or neglects to give such notice he shall forfeit for each offense not less than fifty nor more than two hundred dollars.

Vaccination—Acts of 1894.

Parents and guardians shall cause their children and wards to be duly vaccinated before they attain the age of two years, except as provided in Section 2 of this act. For every year's neglect the party offending shall forfeit the sum of five dollars.

The Board of Health in any city or town shall require and enforce the vaccination and revaccination of all the inhabitants thereof whenever in the opinion of said board the public health or safety requires such action. Every person over twenty-one years of age, not under guardianship, who neglects to comply with such requirement shall forfeit the sum of five dollars.

The Board of Health in any city or town shall furnish the means of free vaccination or revaccination to all the inhabitants thereof whenever in the opinion of said board the public safety requires it.

Incorporated manufacturing companies, superintendents of almshouses, and other places where the poor or sick are received, shall, at the expense of their respective establishments or institutions, cause all the inmates thereof to be vaccinated or revaccinated whenever in the opinion of the Board of Health, in the city or town in which such establishments or institutions are situated, the health of the inmates thereof or the public safety requires such action.

Providing for the Exclusion of Certain Children from the Public Schools—Acts of 1898.

No child who has not been duly vaccinated shall be admitted to a public school except upon presentation of a certificate signed by a regular practising physician that such child is an unfit subject for vaccination. No child who is a member of a household in which a person is sick with smallpox, diphtheria, scarlet fever or measles, or of a household exposed to contagion from a household as aforesaid, shall attend any public school during such sickness, or until the teacher of the school has been furnished with a certificate from the Board of Health of the town or city, or from the attending physician of such sick person, stating in a case of smallpox, diphtheria or scarlet fever, that a period of at least two weeks, and in a case of measles a period of at least three days, has elapsed since the recovery, removal or death of such person, and that danger of the conveying of such disease by such child has passed.

THE DOCTOR AS A CARRIER OF DISEASE.*

By JOHN T. HOWELL, M. D., Newburgh, N. Y.

In these times of successful quarantine and disinfection there yet remains a much neglected danger, which every physician, to be consistent, should carefully consider and endeavor to prevent.

We have fought with pride the victorious battles against sepsis and contagion and have drawn the restrictions more and more tightly about quarantined patients, until they are beginning to dread the deprivations entailed almost as much as the disease itself. But this, we philosophize, is a necessary alternative, and not even our patients would be willing to turn back to the old way by which disease was so widely spread.

The optimist avers he can almost see the dawn of contagious immunity; but I think it is evident that that goal can not be reached until there is maintained a more perfect barrier against contagion than the following familiar picture illustrates:

A doctor is called to see a case of scarlet fever. He announces his diagnosis and recommends that the patient be strictly quarantined in a room with a special nurse, who must change her clothing whenever leaving the room, and must avoid contact with other persons, especially children. These and many other necessary restrictions on the part of the family are faithfully carried out during the whole period of the disease.

The doctor meanwhile visits his patient frequently, and in examining the throat and body comes more or less in contact with the contagion, especially by means of his clothing, which he does not change or disinfect before leaving the house.

It has been asserted in the past, even by eminent authority, that contagion could not be sufficiently impregnated by such exposure as to be carried away; but in the light of the researches of to-day such statements hardly need to be discussed. Certainly the doctor's person or clothing has not yet been proved to be immune from contagion, and I fear that a careful examination of his coat sleeves would reveal a startling number and variety of such disease germs.

Fortunately his patients have a vigilant protector in *resistentia naturæ*, although the physician must occasionally sow some seed in

*Read before the Medical Society of the County of Orange, N. Y., May 2, 1899.

the fertile soil with which he so often comes in contact. When we consider the possibilities of a contagious disease germ—its vitality, reproductive powers and the destruction it may cause—our responsibility as sentinels overshadows all other considerations.

Another way by which the doctor may carry disease is on his hands, especially under his nails; and the difficulty with which their proper disinfection is accomplished makes them a frequent source of infection.

Much has been accomplished by the emphasis which has been put upon this danger, but still there are physicians who continue most careless about this source of infection to their patients. I suppose many a physician would scoff at or resent the suggestion that he should wear his hair closely trimmed and beard shaven; but a second thought must convince him that the idea is in no way extreme. Then, too, his thermometer, hypodermic syringe, medicine case, prescription book and many other daily necessities need to be watched, as they are used about from house to house and may easily become carriers of disease. All of these channels through which contagion or sepsis might be, and I believe often are, spread are well enough known, but so generally overlooked that I have thought it important to bring the danger to your attention, and at the same time offer some suggestions as to ways in which they may be averted.

In regard to contagion, it has been shown that it travels chiefly along certain well-known channels; and I believe were our energies bent almost wholly toward the control of these, many of the rigorous restrictions of the present system of quarantine might be safely relaxed. Physicians should point out these sources of danger and endeavor to educate the public to understand that it has only these to really fear, and that it is the same with contagion as in other matters—probable dangers, not possible ones, warrant attention.

The doctor in attendance upon a patient suffering from a contagious disease is most liable to carry the germs away upon his clothing, and therefore that should be properly protected, especially at those times when the contagion is most actively thrown off.

For this purpose I have worn for a number of years past a gossamer rubber overcoat, which forms a perfect protection, and because of its lightness is very convenient. A complete covering would include a hood for the hair; but with care its use is seldom necessary. With such an impervious protection and care to avoid un-

necessary contact with the patient, the doctor, after having disinfected his hands (and face, if need be) can leave the room, hang up his coat in some place provided near by, and walk out of the house conscious that he does not carry with him any of the dread contagion. I keep two or more such coats on hand, which are thoroughly disinfected after each case, and when rolled up occupy the space of the smallest kind of a bundle in my carriage.

For the disinfection of clothing, when from any acident that may become necessary, the use of formaldehyde gas is undoubtedly one of the best means we now have.

It in no way injures fabric, and therefore can be safely used to disinfect anything which cannot be subjected to heat. Sterilization by high temperature is the crucial method, but obviously can be used but in a limited way for one's personal needs.

The rubber tissue finger cots afford us a most practical and efficient protection. They protect our fingers from infectious wounds or when making orificial examinations; and when the cots have been sterilized they will protect an aseptic wound from any infection that may be upon our fingers.

The use of these and rubber gloves has at least made it possible for us to have sterile hands at any time, and they form the last link needed to perfect aseptic surgical technique.

While the control of contagion is not so wholly within our power as that of infection, the powerful reinforcements we have received from antitoxines promise to relegate, in time, diphtheria, and perhaps scarlet fever, to the place of smallpox.

But as the control of smallpox, we should remember, was not accomplished alone by vaccination, so must the troublesome methods of quarantine and disinfection continue to be employed in the warfare against other contagious diseases.

With such a victory in view, we should renew our courage and so strengthen all of these weapons that they shall be impervious to those darts from which we have in the past failed to shield our patients.—From the "New York Medical Journal," July 8, 1899.

SCHOOL DIRECTORS AS BOARDS OF HEALTH.

The law of Pennsylvania, passed last winter, authorizing the School Boards of the various townships in the rural districts to act as Boards of Health is as follows:

Section 1. Be it enacted, etc., that the School Directors in each township of the State of Pennsylvania shall, in addition to the power vested in them by existing laws, have full power and authority to make and enforce all needful rules and regulations to prevent the introduction and spread of contagious or infectious diseases, by the regulation of intercourse with infected places, by prohibiting from attending any public school any child or other person belonging to or residing with the family of any person, or residing in the same house in which any person may be suffering from cholera, smallpox (variola varioloid), scarlet fever, typhus fever, yellow fever, relapsing fever, diphtheria, diphtheritic croup or membraneous croup, or any other contagious disease; and it shall be the duty of all physicians practicing within the several townships to report to the secretary of such School Board the names and residences of all persons coming under their professional care, afflicted with any of the aforesaid contagious or infectious diseases, within twenty-four hours after the development of any such disease.

Sec. 2. In the case of the prevalence of any contagious or infectious disease in any township of this Commonwealth, the Board of School Directors of such townships shall have power by themselves, or by a sanitary agent to be by them appointed, to enter at any time upon any premises in the said township in which there is suspected to be any contagious or infectious disease, or nuisance productive of such disease or detrimental to the public health, for the purpose of examining the said premises and abating any nuisance found thereon detrimental to the public health.

Sec. 3. Before appointing any sanitary agent to aid in enforcing the rules and regulations of the board, as aforesaid, the board shall make application to the Court of Common Pleas of the county in which the township is located, or to a law judge thereof, setting forth particularly the reasons which, in their judgment, make the application of such agent necessary, setting forth also the compensation which the board deems proper to pay for the services of such sanitary agent, and if the said Court or Judge thereof shall approve the reasons given by the said board for the appointment of such sanitary agent, and shall also approve the compensation deemed proper therefor, said board shall have the authority to appoint such sanitary agent for such term as may be designated by the said Court or Judge thereof, the said compensation to be paid out of the school fund of the respective townships.

VACCINATOR NOT LIABLE FOR USE OF IMPURE VACCINE.

A municipal corporation, while enforcing a valid ordinance requiring citizens and residents of the city to submit to vaccination, is exercising a governmental power, and, the Supreme Court of Georgia holds, in the recent case of Wyatt vs. the City of Rome, is therefore not liable to a citizen who may sustain damage on account of the impure vaccine matter administered to him by one of the officers or agents of such corporation. To allow any citizen a right of action on account of injuries, real or supposed, that he may have suffered in the interest of the public good, the Court says, would be to paralyze the arm of the municipal government, and either render it incapable of acting for the public weal, or would render such action so dangerous that the possible evil consequences to it, resulting from the multiplicity of suits, might be as great as the smallpox itself. Hence the wisdom of the law in exempting it from liability on such an alleged injury as one resulting from the negligent administration of impure vaccine matter by the officers or agents of a city while enforcing a valid ordinance. The right to prescribe regulations looking to the preservation of the public health, further says the Court, is one of those sovereign powers that belong to the State. This power can be delegated by the State to any of its subdivisions of government, such as a municipality or a county, and in the use of it by such subdivisions they are in the exercise of a function purely governmental. When a municipality exercises a governmental power conferred upon it by the State, it is just as if the State itself were in the exercise of the function thus conferred. And it is upon the idea, as old as the English law—"the king can do no wrong"—that the sovereignty of a State protects it against suits by its subjects, no one having a right to hold it liable for any of its officers or agents, unless such right is expressly granted by the State itself. Among the precedents which have been established by courts of last resort that are apparently exceptions to this general rule, the Supreme Court of Georgia says it has been able to find none that would hold a city liable for any injury that may be sustained as the result of enforcing measures legally enacted for the promotion and preservation of the public health.—"Jour. Am. Med. Assn."

THE RANK OF THE SURGEON-GENERAL OF THE ARMY.

(From the "New York Medical Journal," July 8, 1899.)

We have long held that the present rank of the Surgeon-General of the Army, that of a brigadier-general, was not high enough to be commensurate either with the dignity and importance of the medical corps or with the capabilities required in the incumbent of the office. We are glad to see that at its recent annual meeting the Medical Association of Georgia took action that ought to result in bringing home forcibly to the profession, and, through them, to Congress the urgent need of according higher rank to the Surgeon-General. We are indebted to the association's secretary, Dr. R. H. Taylor, for a copy of certain vigorous resolutions passed at the Macon meeting. They set forth that the office of Surgeon-General of the Army involved great and grave responsibility and the direction of vast interests, and called for the highest order of professional skill, learning and executive ability; also that the number of officers and soldiers under the direction of the Surgeon-General in an army organized like that of the United States was greater than that under a division commander; and that it was the sense of the association that the Surgeon-General should have the rank, pay and allowances of a major-general. The meeting further resolved to send copies of its resolutions to the President of the United States, to the Secretary of War, to the Georgia Senators and Representatives in Congress, and to all the medical societies of the United States requesting them to join in the association's appeal.

The committee appointed to communicate this action to other medical bodies is doing its work promptly and most commendably. The chairman, Dr. J. Lawton Hiers, of Savannah, makes the forcible remark that members of the profession who are likely to be called to the office of Surgeon-General must make a sacrifice in income when they are so called, even if the rank, pay and allowances are raised to those of a major-general, and that that consideration as well as the dignity of the profession requires, in the association's unanimous opinion, the elevation sought for. We do not see that these arguments can be refuted, and we are heartily in accord with the Medical Association of Georgia in its effort to secure the co-operation of other medical societies. We would, in-

deed, go further and urge upon individual physicians the duty of exerting what influence they are capable of upon their Congressmen to endeavor to bring about the proposed elevation of the office of Surgeon-General of the Army.

THE SANITARIAN thoroughly concurs in the foregoing views of its esteemed contemporaries, and urges in addition that the increase of rank should carry with it authority to prevent for the future all such misadventures as choosing camp sites without sanitary knowledge and the supply of food of doubtful wholesomeness, the most painful incidents of the Spanish-American war.

PUBLIC SPIRIT OF AMERICAN WOMEN.

From the Boston "Transcript."

Justice has never yet been fully done to the public spirit of American women. Ever since December 11, 1620, when the Pilgrim Mothers landed on Plymouth Rock to die like sheep of cold and privation during the six fearful months that followed, until the advent of Clara Barton and her Red Cross nurses—last year braving malaria and yellow fever in the hospitals of Cuba and Porto Rico—American women have been veritable angels of salvation to the men of this nation. In the wars that have tormented every generation—wars with Indians, Frenchmen, Spaniards, British, Mexicans, and brother Americans—the brightest pages of our history are those that tell how the women have toiled and struggled and died that the nation might live. This public spirit of women has not been confined to North or South, East or West, Federal or Confederate. It has shown itself alike in war and in peace, in Sanitary Commissions and Volunteer Aid Associations, in Civic Clubs and Suffrage Societies, in gratuitous services for schools and libraries, charities and reformers. It is safe to say that but for the unselfish enthusiasm and patriotic ardor of women, notwithstanding their political disabilities, our politics would have been ruined by corruption and we should ere this have become the helpless prey of demagogues.

The latest manifestation of this feminine public spirit—this mother instinct applied in the realm of politics—has just been strikingly shown in an unexpected quarter, on Tuesday, June 6, in the city of New Orleans. This beautiful city, at the mouth of the Mississippi, is destined by nature to become one of our great-

est seaports—the commercial inlet and outlet of the central valleys and plains of the North American continent. But for generations its growth has been retarded by epidemic disease resulting from lack of drainage and an inadequate water supply. The enormous expenditure of money required to overcome these obstacles has made it hitherto impossible to secure an adequate appropriation for the work. Again and again the attempt has been made, but has been voted down by the male property owners.

But, two years ago, the Constitutional Convention of Louisiana, at the urgent request of leading Southern women for the ballot, gave to property-owning, taxpaying women the right to vote on all questions submitted to the taxpayers. This seemed a very slight and inadequate concession. No one dreamed of the consequences that would follow.

Already it has literally lifted New Orleans out of her "slough of despond." Legislation enabling the city to construct a system of underground sewers and to provide a pure water supply, has been carried by the votes of male and female taxpayers. Under the law a certain proportion of taxpayers had to sign a petition for a special election on the question. By the organized help of the women the needed number of signatures was with great difficulty obtained, and the special election has been held. By the united votes of the men and the women the special tax has been voted. The New Orleans newspapers frankly declare that the successful result is due to the earnest co-operation of the women, and could not have been attained without it. When a similar attempt was made ten years ago by the male voters, it failed ignominiously.

Henceforth New Orleans will enter upon a new era of prosperity. From being a centre of disease, she will become one of the healthiest of American cities. Relieved from the incubus of unsanitary conditions she will soon become one of the most populous American cities. And she will owe her redemption directly to her public-spirited women voters.

Nor was this a mere local issue. The whole Mississippi Valley will be benefited by this achievement of the Louisiana women. New Orleans is only a few hours' sail from Havana. She will be the Metropolitan centre of our West India possessions. Here is the gate through which yellow fever has repeatedly entered the United States. Hereafter, with improved sanitary conditions and a rigid quarantine at New Orleans, the disease will obtain no foothold.

MEDICAL EXCERPT.

By T. P. CORBALLY, A. M., M. D.

CEREBRAL RHEUMATISM.—In a report made to the Société Médicale des Hopitaux ("Le Progrès Médical," 17 Juin) M. Souques gives the history of a case of rheumatism of the brain which he had treated, which was accompanied with violent delirium. The patient died. At the autopsy there was nothing particular found in the nervous system, nothing in the lungs and nothing in the heart. There was manifest an acute nephritis. Upon examination the cephalorachidian fluid, obtained by puncture in the lumbar region, contained no microbes and in other respects was free from toxic elements. M. Souques, supported by Wasserman, advances the hypothesis that the nerve cell has a special affinity for the rheumatismal toxine, which it fixes on the organ, and thus giving rise to the absence of the toxic element in the cephalorachidian fluid. The patient was of an exceedingly nervous temperament, which he inherited from parents who were highly nervous, and these conditions will most probably explain the phenomena that were found in the case.

M. Widal supports the ideas here advanced by M. Souques. Very often cases are diagnosed as cerebral rheumatism which are really cases of secondary meningitis, maybe of uremia or of nervous trouble depending on other causes. It is necessary here to recall the opinions that are held regarding the action of toxines in convulsions by the action of the serum on the cerebral cells. The experiments made with the serum known as epileptic, tetanic, etc., injected into brain of rabbits, have given only negative results. It often happens that a waste of nerve force gives rise to the convulsive attacks found in uremia, and he cites in evidence a case similar to that described above.

PHTHISIS AND CREOSOTE.—M. Bucquoy ("Gazette Hebdomadaire," June 25th) presented to the Académie de Médecine a report on the memoir of M. Savoire on the treatment of phthisis pulmonalis with large doses of creosote. M. Savoire advises doses of 6 to 10 grams a day. Patients bear such doses very well, and all to whom these large doses were given presented evidence of great

improvement. They have manifested a remarkable improvement in their appetite and nutrition as evidenced by an increase in weight, very rapid and great improvement in the cough, in the perspiration, in the fever and especially in the expectoration; in very many cases a notable disappearance of the bacilli. This improvement usually continued for a greater or less period.

M. Bucquoy considers creosote an excellent remedy in cases of pre-tubercular dyspepsia.

WOUNDS IN THE CHEST.—M. Delorme, of the Military School of Val-de-Grace, presented a very interesting communication to the Académie de Médicine on surgical intervention in wounds of the chest ("Gazette Hebdomadaire," June 18th).

M. Lucas-Championnière had demonstrated the importance of expectant methods in penetrating wounds caused by balls from a revolver or other weapon and showed the uselessness of probing for the projectile even when the situation had been well defined by the radioscope.

M. Delorme thinks, on the contrary, that in certain cases the surgeon should not hesitate to apply the ligature to portions of lung that had been wounded.

M. Delorme did this in a remarkable case, which he described; but, although it was not successful, others have obtained better results: MM. Quénn, Michaux and Annequin.

M. Lucas-Championnière advises perfect rest for the patient and cautions against syncope in case of surgical interference.

RADIOGRAPHY AND SPINAL DISEASES.—In a "Revue des Maladies l'Enfance," taken from the "Annales de Médecine et de Chirurgie Infantiles," the "Progrès Médical," June 10th, gives some remarks of Redard and Laron on the importance of radiography in the diagnosis and the treatment of change of form in the spinal column.

The communication is intended to demonstrate that we can obtain with great precision a picture of the spine involved, its form and the position of the vertebræ. The improvements that are constantly made in radiography make it a powerful means of investigation. Its help is more particularly found in the diagnosis and treatment of Pott's disease and of scholiosis.

In support of these asertions the authors cite facts that have resulted from cases which they have treated. Their radiographic

tests show fully and distinctly the centres of tuberculous disease of the vertebræ at different stages of advancement. And still more, the initial stages of tubercular lesions are fully disclosed by radiography. By this means we are enabled to make a clear diagnosis of Pott's disease in its earliest stages, even when the objective and subjective symptoms show very little that is satisfactory.

By this means the number of the vertebræ attacked, the extent of the lesion and its extent, etc., etc., are easily recognized.

In scholiosis it is easy to make a precise diagnosis of the condition of the spinal column.

The use of radiography in investigating other forms of spinal disease, of deformities in the joints in bone substance and in all surgical cases in children who may not be able to help in the investigation is of greatest advantage.

CHOLERA INFANTUM.—Dr. Wm. I. Watson, of Philadelphia ("Codex Medicus," Philadelphia), says: The first indication in the medical treatment should be to arrest the vomiting and purging, for which, if called to see a case in the first twenty-four hours, I always give an intestinal irrigation by means of a copious enema of from one to three pints of warm or cool water, to which I add ℥iii to ℥iv of Listerine, allowing it to flow from an ordinary fountain syringe into the bowel. Often when there is restlessness, pain and tenesmus, this amount of water, if used as warm as can be borne, will quiet the child in a few minutes and sometimes give permanent relief. After the bowels have been thoroughly washed I prescribe the following:

℞ Bismuthi subcarbonas.....℥ i—℥ii.
Spir. myristicæ. .....minims xx.
Spir. vini gallici.....℥ iii.
Listerin. .....℥ ss.
Misturia cretæ. .....q. s. ad. ℥ iii.

M. Sig.—One drachm every three hours until relieved.

If the child is suffering from pain which cannot be relieved by external applications, small doses of some preparation of opium may be used, preferably the camphorated tincture.

The hygienic surroundings should be carefully attended to and the child should be kept perfectly clean. It should be put to bed in a well ventilated room and given only liquid diet. The clothing

must be as thin as possible, but flannels should always be worn next to the skin. Small pieces of ice may be given to relieve the thirst. When water is used it should always be filtered or boiled. Should the child be bottle-fed, great stress should be laid upon the care of the milk, nursing bottle and nipples. The entire body of the child should receive a sponge bath with water at 80° F., and be gently dried.

A NEW INFECTIOUS DISEASE OF DOGS.—Dr. Johannes Horowitz writes to the New York "Times" ("Medical Record") from Vienna that for a year past an extraordinary number of dogs have been taken ill and died in different German towns under very striking conditions. At first it was believed to be due to malicious poisoning, but it was soon discovered to be a malignant epidemic. From the observations of Herr Kurtz, veterinary surgeon at Stuttgart, it appears that the disease, which everywhere assumes the form of an epidemic, is an infectious disease of the nature of gastric catarrh, with bleeding from the mucous membrane of the mouth. At Stuttgart at first 75 per cent. of the cases ended fatally, which number afterward fell to 40 per cent. The epidemic is now nearly over there, but as yet the cause of the disease is unknown. Animals which have once had the complaint and recovered seem to acquire immunity, for no case has been observed in which a dog has been attacked twice.

BIG WORDS TO A SMALL WITNESS.—A young lawyer from the North, on beginning practice in Virginia, in the sixties, questioning a colored witness, asked:

"Did the defendant knock the plaintiff down with *malice prepense?*"

"No, sir; he knocked him down with a flat-iron."

"You misunderstand me, my friend; I want to know whether he attacked him with any evil intent?"

"Oh, no, sir, it was outside of the tent."

"No, no; I wish you to tell me whether the attack was at all a preconcerted affair?"

"No, sir; it was not a free concert affair—it was at a circus."

EDITOR'S TABLE.

SANITARIAN, AUGUST, 1899.

☞All correspondence and exchanges, and all publications for review, should be addressed to the Editor, Dr. A. N. Bell, Brooklyn, N. Y.

POLLUTED SOIL AND ITS DANGERS.

Polluted water is so generally recognized as the prevailing means by which typhoid fever, cholera and other intestinal diseases are propagated that polluted soil, the chief adjuvant of polluted water, though scarcely less dangerous in its relation to intestinal diseases, and more dangerous in its relation to some other infectious diseases and much more durable than polluted waters, is not infrequently overlooked.

Bollinger demonstrated the presence and long retained vitality of spores of bacillus anthracis in the soil nearly thirty years ago and pointed out the important bearing of this retained vitality of germ spores on the question of soil infection generally; and, referring to the irregularity in the outbreaks of epidemic diseases, he suggested their probable dependence upon the conditions, favorable or otherwise, under which the vitality of their germs was maintained.

Enormous numbers of bacteria in great variety have been found in the soil by various observers. Infusions made from manured fields and garden earth, even though diluted a hundred times or more, still contain thousands of bacteria in every drop; and the soil and dust of roadways and streets always contain large numbers. Beumer, in experimental researches for bacteria in the soil (1886), obtained from a specimen of sandy humus taken from the depth of three metres, 45,000,000 to the gramme. In a church-yard, at a depth of four metres, the number in one experiment was 1,152,000, and in another 1,278,000 to the gramme. Naegeli and Buckner have demonstrated that the porous soil of the earth will yield germs existing in it to ascending currents of the air even when wet, a fact which has a strong bearing upon the significance of the soil in the spread of infectious diseases generally.

When we reflect upon the continually accumulating mass of organic matter on the surface of the ground and in the subsoil of populous places, and particularly where there is no subsoil drainage, and consequently the need of bacteria for the transformation of such matter into its original elements, and consider the constant

process of putrefaction in such soil by which it is decomposed and incorporated with the soil, dissolved in the soil water or taken up by the ground air, and consider the agencies by which these transformations are accomplished, we are prepared in some degree to appreciate the relations of bacteria, and the conditions by which they are sustained and propagated, to human health.

Fortunately for the well being of mankind, the saprophytic or salutary bacteria in the soil commonly greatly exceed in number the pathogenic bacteria or disease germs. And, between these, as between the leucocytes or white-blood corpuscles and parasites in the blood, there is an unceasing antagonism of forces.

As in the one case, an excessive accumulation of organic matter in the soil, and conditions of moisture and temperature more favorable to the multiplication of pathogenic bacteria than of the saprophytic, will promote the ascendancy of the former; so, in the other case, if the physique is impaired from any cause, badly nourished. intemperance, overwork, etc., by which the leucocytes are diminished or enfeebled, they are in no condition to resist the invasion of pathogenic germs of any kind.

Bacteria of various kinds exist in the soil and retain their vitality for indefinite periods. Graucher and Deschamps assert that it is probable that pathogenic bacilli germinate in the soil, and they cite examples of cholera, typhus and other species of bacilli found at various depths and for various periods. With regard to typhoid fever and plague, the reader is referred to articles in our preceding number and repeatedly in preceding volumes, and with reference to yellow fever to the literature of the subject generally, but exceptionally to that of Charleston, S. C.,* for a two-fold purpose: The frequent occurrence of yellow fever there during many years, while the undrained soil was loaded with putrescible matter and more or less constantly upturned regardless of season; and conversely, the non-recurrence of the disease during the last forty years while the soil has been drained. Manifestly with subsoil drainage every downpour of rain is a soil cleansing process, the residue being carried off by the drains.

However, it should not be inferred from this citation that the sanitary conditions of Charleston are adequate against the introduction or possible eruption of yellow fever. The drains referred to are dilapidated, much filth has accumulated and is still accumulating in the soil and efficient sewerage is an imminent need. There

*Report of the Committee of the City Council of Charleston upon the epidemic of yellow fever of 1858.

are many night soil pits and other filth storage recesses throughout the city, adding to the receptive conditions of the soil, while their foul emanations greatly add to sickness susceptibilities of all sorts.

It would be superfluous to the readers of THE SANITARIAN to here reiterate the natural history of yellow fever, so fully written and so frequently referred to in its pages during the last twenty-five years. Few diseases have been more thoroughly studied or so often described. It is conceded to be a disease of pathogenic germ origin, though *the* germ is still of questionable character. The conditions of its vitality, however, are sufficiently well known to justify the conclusion that, if dealt with intelligently, it will ere long cease to be tolerated in this country.

Koch and Duclaux tell us that pathogenic germs leave the earth in many ways to attack men and animals. The turning up of an undrained soil liberates pathogenic germs, and when the soil is not disturbed for a long time a colossal germination frequently goes on. Exhumation frees the bacteria latent in the soil, hence the epidemics that follow the upturning of fresh ground. The soil which adheres to the body, to the feet of animals and that which is carried by insects disseminates pathogenic germs. Currents of air transport superficial dust and so transport the spores which have resisted dessication.

The two most potent means of destruction which pathogenic bacilli encounter are the saprophytic microbes and solar light. As before remarked, the saprophytic microbes are in continual strife with the pathogenic germs, and have generally the advantage.

Solar light alone is fatal to most bacilli, and, according to Duclaux, it is the most universal means of sanitation, and the most economical and potent to which public or private hygiene can have recourse.

DEPARTMENT OF PUBLIC HEALTH.

At the meeting of the American Medical Association, June 6-9, 1899, Dr. C. O. B. Wingate, chairman of Committee, reported substantially as at previous meeting, urging the "Spooner Bill," as already endorsed by the association, which, "it is believed" by the committee, "will become a law during the next Congress."

EFFICIENT QUARANTINE.

It is unfortunate ("Medical News," July 1st) that we have not a uniform system of quarantine. Quarantine regulations at pres-

ent are dependent on State governments and differences are very notable. So long as the responsibility for the public health of the country is thus divided among many, loopholes for the entrance of epidemic disease are liable to be left unprotected, and the lack of a national bureau of health will be more and more felt in the immediate future. The Marine Hospital Service is doing all that can be expected of it, with its inadequate means and unsatisfactory authority. It is certain that the work accomplished by it even under these trying conditions is making clearer the advisability of committing the care of public health to a central bureau.

The State government of Georgia has recently turned over to the United States Marine Hospital Service its quarantine at Savannah. The effective work done by this department in the Southern States at times of yellow fevor invasion during the past few years certainly justifies this action and stamps it as a step in the right direction. It is to be hoped that other State governments will see their way to a movement in the same direction. Under present conditions and without the national bureau of health that we should have, this voluntary appeal to the Marine Hospital Service seems the action most suited to secure easily and promptly the uniformity of quarantine regulations.

BLOOD SERUM IN THE TREATMENT OF YELLOW FEVER.

Under the auspices of Dr. A. H. Doty, Health Officer of the Port of New York, Dr. Charles B. Fitspatric, pathologist and director of the bacteriological laboratories of the health officer's department, is rehearsing Sanarelli's experiments in the treatment of yellow fever.

By serum therapeutic properties, he says ("Medical Record," July 1st), I mean the power that specific pathogenic bacteria possess of producing toxins and causing to be formed in the blood of susceptible animals a substance which bears a preventive and curative relation to the specific disease.

The culture used to produce the toxins and to inoculate the animals was the culture of the bacillus icteroides which Dr. Sanarelli sent to the health officer's department. Two horses were chosen to be subjected to the process of immunization, in order to obtain the preventive and curative serum from their blood. The injection fluid was made up of the living culture, or filtered cultures.

The virulence of the culture used has varied. The original culture sent to the laboratory by Dr. Sanarelli caused the death of a

guinea pig weighing 300 gm. in about seven days when injected in a dose of ½ c.c. or more intraperitoneally. I have increased the virulence of the culture so that the subcutaneous injection of ½ c.c. to 1 c.c. causes death. The culture now used acts as follows:

Guinea pig, weight 235 gm., inoculated subcutaneously with 1 c.c., died in 6 days.

Guinea pig, weight 235 gm., inoculated subcutaneously with 2 c.c., died in 3½ days.

Guinea pig, weight 260 gm., inoculated subcutaneously with 3 c.c., died in 2½ days.

It is readily seen from the above that the culture does not cause in guinea pigs a disease with a definite cycle, or an infection which has a definite period of incubation and development. The intensity of the incubation depends upon the dose, and with a smaller dose death in some cases takes place as late as nineteen days after the infection. The character of the reaction in horses has been a direct rise of temperature within twenty-four hours and a fall to about normal within the next twenty-four hours. This is the typical reaction following intravenous injections.

The serum I have succeeded in preparing has been compared by a series of experiments with serum obtained from the laboratory of Dr. Sanarelli in Montevideo, Uruguay, and has given more uniform results than the South American serum."

A case of yellow fever has been reported under treatment with the serum at the quarantine hospital and is said to be doing well.

A NEW ANTITOXIN.

Dr. Oscar Loew, one of the vegetable pathologists of the U. S. Department of Agriculture, has developed to what he believes is a point of practical use a new germicide, which promises to supersede the serum treatment now in use in diphtheria, fevers and many other diseases. Dr. Loew's work has been carried on for several years, in collaboration with Dr. R. Emmerich, in the laboratories of Munich and this country.

The treatment is similar in some respects to the serum treatment, but depends on a different principle, the basic idea being the presence of a class of ferments known as enzymes, which are produced by the same bacteria that produce the disease. It is because of the production, or rather overproduction, of a certain enzyme that a disease such as typhoid will "run its course" and then die out of the system. The bacteria in this case, it is stated, are simply

killed out by the ferment they produce. The object of the new treatment is to produce a pure enzyme, which, introduced into the human system, will kill the disease germs without injuring the patient. This differs from the principle of inoculation for small-pox and other diseases, where the object is to give the patient a mild type of the disease to render him immune to the more virulent type.

Dr. Loew and Dr. Emmerich have studied and cultivated the enzymes of various diseases, and, it is claimed, have found that the enzymes of certain bacteria will kill not only their parent germs, but also the germs of cholera, typhoid fever anthrax, diphtheria, black plague, staphlococci and probably genococci. An enzyme that will be fatal to tuberculosis is being sought, though the bacillus of tuberculosis seems to be incapable of producing an enzyme that is fatal to itself. This is also true of the black plague, and for this reason the serum of black plague was applied without success in the cases recently developed in one of the laboratories in Vienna.

The enzymes are very unstable products, and for this reason quickly deteriorate, but Dr. Loew believes he has found a method of preserving them in shape for use. The further development of this form of treatment is awaited with interest by scientists.

THE KISSING BUG.

That annoying insect popularly known as the "kissing bug" ("Medical News," July 8th), which has been epidemic recently in Washington and Brooklyn, has visited Philadelphia, in the course of its peregrinations northward, its presence here having become very evident by reason of the dozens of persons who have suffered from its bite during the past three or four days. The bites of this insect, which usually occur on the lips of the individual attacked—hence the name, "kissing bug"—are quickly followed by extensive swelling of the part, which becomes red and inflamed, and exceedingly sensitive. Signs of active cellulitis are often present, and the lips swell to two or three times their normal size, so that articulation and eating may be impossible. The process subsides rapidly after forty-eight to seventy-two hours' duration. The exact identity of the insect concerned in this epidemic is somewhat in doubt, but it is thought to be one of the varieties of the so-called "assassin bugs," probably the opiscoetus personatus, which is a common parasite of the ordinary bed bug and house fly. It is an

insect nearly an inch in length, of dark, brownish-red color and having six legs and long antennæ. During the past week more than a dozen persons have applied for hospital treatment on account of its bites, and according to current reports the list of its victims continues to increase from day to day.

SUNSHINE AND RAIN IN EUROPE.

According to a recent report issued by the French Bureau of Agriculture, at 78 Rue de Varennes, Paris, Spain and not Italy should have the adjective "sunny" placed before it. On the average, it is said, Spain enjoys about 3,000 hours of sunshine a year, while Italy has 2,300. France has almost as much sunshine as Italy, her figures being 2,200. Germany has at her disposal no more than 1,700 hours, while England, the land of fogs, has to get along with 1,400, less than half of Spain's amount. The average fall of rain in England is, however, greater than that of any other European country. In the northern part and on the high plateaus of Scotland is it estimated that about 8,890 millimeters (about 351.25 inches) fall each year. In Central England the rainfall averages 6,000 millimeters. London is said to have on the average 178 rainy days in the year. Northern Germany has a rainfall of 1,290 millimeters. In Alsace the water is reckoned at 1,360 millimeters. Among the Alps St. Bernard receives the greatest rainfall; the annual average registered there has been 2,564 millimeters. In Paris the average does not go beyond 560 millimeters, which is about one-tenth of the quantity that falls upon London.

MORTALITY AND MORBILITY REPORTS AND REVIEWS.

NEW YORK.—Total number of deaths reported by State Board bulletin for May, 9,556; annual death rate, 17.75; from zymotic diseases, 800.

City of New York, 3,550,053: Total deaths, 5,217; annual death rate, 17.33; from cerebro-spinal meningitis, 38; typhoid fever, 27; scarlatina, 61; measles, 75; erysipelas, 34; whooping-cough, 27; diphtheria, 160; diarrhœal diseases, 64; consumption, 671.

Borough of Manhattan, 1,953,569: Total deaths, 2,987; death rate, 18.00; from cerebro-spinal meningitis, 25; typhoid fever, 18; diphtheria, 85; phthisis, 365; percentage of deaths under 5 years of age, 31.8.

Borough of the Bronx, 163,537: Total deaths, 285; death rate, 20.4; from smallpox, 5; diphtheria, 9; phthisis, 71. Many large institutions raise the death rate.

Borough of Brooklyn, 1,231,548: Total deaths, 1,686; death rate, 16.32; from typhoid fever, 8; diphtheria, 60; phthisis, 209; diarrhœal diseases, 16; percentage of deaths under 5, 30.3.

Borough of Queens, 134,139: Total deaths, 168; death rate, 14.70; from diphtheria, 3; phthisis, 11; percentage of deaths under 5, 32.8.

Borough of Richmond, 67,269: Total deaths, 91; death rate, 15.9; from diphtheria, 3; phthisis, 12; percentage of deaths under 5, 20.9.

City of New York, for the four weeks ending July 8: Total deaths, 5,206; annual death rate per 1,000 population, 19.13; deaths under 5 years of age, 2,426; deaths from diphtheria, 104; croup, 23; malarial fever, 11; measles, 45; phthisis, 441.

Borough of Manhattan: Total deaths, 2,770; under 5, 2,426; death rate, 18.32. The Bronx: Total deaths, 258; death rate, 20.55. Brooklyn: Total deaths, 1,899; death rate, 20.12. Queens: Total deaths, 201; death rate, 19.55. Richmond: Total deaths, 78; death rate, 15.13.

Percentage of deaths under 5 years to total mortality not given in detail. But it has been excessive in Brooklyn and the subject of considerable comment by the Brooklyn press, which seems to have but just now discovered the relative increase of infantile mortality of the Borough (and while one city) of Brooklyn over that of Manhattan and the Bronx, the City of New York. The fact is that this gain of the City of New York over Brooklyn has been in process for many years. It is due to the more comprehensive and energetic sanitary service in that city than in Brooklyn. For example, for a dozen years or more foul cellar-stables and manure vaults have been prohibited in New York, while hundreds of them still obtain in Brooklyn, constantly evolving their foul odors, intensifying the susceptibility of all weakly persons and of children in particular to all diseases. And there yet exist, scattered here and there throughout Brooklyn, several—certainly not less than two—thousand privy vaults, subject to being emptied when full, not oftener than once in a year or two, all the while evolving their foul gases and promoting the propagation of disease. The sidewalks of the chief business and shopping streets are the common display-places for fruits and vegetables, constantly subject to street dust. These and many other unsanitary conditions obtain now, as they did before the consolidation of Brooklyn with New York eighteen months ago, but the consolidated Health Department has not taken them in!

Albany, 100,000: Total deaths, 146; death rate, 17.20; from typhoid fever, 13; diphtheria, 2; phthisis, 24.

Troy, 65,000: Total deaths, 99; death rate, 18; from typhoid fever, 1; phthisis, 21.

Utica, 55,000: Total deaths, 68; death rate, 14.60; from diphtheria, 1; phthisis, 8.

Syracuse, 120,000: Total deaths, 133; death rate, 13.10; from typhoid fever, 1; phthisis, 16.

Buffalo, 360,000: Total deaths, 359; death rate, 11.71; from typhoid fever, 4; diphtheria, 4; phthisis, 50.

Rochester, 175,000: Total deaths, 159; death rate, 10.70; from typhoid fever, 1; diphtheria, 4; phthisis, 14.

Yonkers, 42,000: Total deaths, 54; death rate, 15.14; from phthisis, 8.

Cohoes, 25,000: Total deaths, 28; death rate, 13.15; from typhoid fever, 3; phthisis, 5.

Kingston, 25,000: Total deaths, 31; death rate, 14.60.

Poughkeepsie, 25,000: Total deaths, 23; death rate, 11.0; from phthisis, 4.

Newburgh, 26,000: Total deaths, 30; death rate, 10.0; from phthisis, 3.

Schenectady, 27,000: Total deaths, 27; death rate, 11.15.

Binghamton, 45,000: Total deaths, 48; death rate, 12.57; from phthisis, 7.

Elmira, 35,000: Total deaths, 41; death rate, 12.05; from phthisis, 5.

Oswego, 22,000: Total deaths, 21; death rate, 11.45; from phthisis, 4.

CALIFORNIA.—San Francisco, 360,000, May, '99: Total deaths, 336; death rate, 17.66; from typhoid fever, 10; "specific febrile," 28; diphtheria, 3; scarlet fever, 5; consumption, 51.

Annual report for the fiscal year ending June 30, 1898—a volume of nearly 700 pages, with numerous diagrams and maps—comprehending in detail a great amount of information of local interest and much of general interest: Estimated population, 360,000; births registered, confessedly incomplete, exclusive of 315 still births, 5,359; marriages, 3,019; deaths, 6,544; death rate, 18.18. Of infectious diseases there were reported during the year: Diphtheria, 736 cases, 154 deaths; measles, 11 cases, 1 death; scarlet fever, 108 cases, 9 deaths; typhoid fever, 76 cases, 57

deaths. The fallacy of this statement is apparent on the surface. For 57 deaths from typhoid fever there were certainly not less than 550 cases—five times as many as reported. Thirty-nine pages are devoted to diphtheria. Of 144 cases treated with antitoxin there were 16 deaths, 11.11 per cent., as against 23.14 per cent. of those not so treated, assuming the number of cases reported to be correct.

Deaths from pulmonary tuberculosis, 994—15.2 per cent. of the total mortality (6,544) from all causes. There were, besides, 130 deaths from other tuberculous diseases, 179 from bronchitis and 4 from "gangrene" of the lung.

Of the subordinate special reports the chemist's is of widest interest. It embraces the analyses and other investigation of foods, with the purpose of detecting adulteration and other impurities, and shows results of importance everywhere, and, besides these, illuminating gas supplies and their dangers and the results of water analysis.

Los Angeles, 103,000, May, '99: Total deaths, 145; death rate, 16.89; from diphtheria, 7; cerebro-spinal meningitis, 6; consumption, 20.

COLORADO.—Denver, 167,000, May, '99: Total deaths, 120; death rate, 8.52; from phthisis, 39; cerebro-spinal fever, 9.

CONNECTICUT.—The Secretary of the State Board sums up 167 towns, 89,245, May, '99: Total deaths, 1,025; death rate, 13.7; from typhoid fever, 5; diphtheria, 13; phthisis, 112.

New Haven, 112,000, May, '99: Total deaths, 125; death rate, 13.1; from typhoid fever, 1; diphtheria, 5; phthisis, 16.

Hartford, 80,000, May, '99: Total deaths, 92; death rate, 13.5; from phthisis, 8.

Bridgeport, 65,000, May, '99: Total deaths, 72; death rate, 12.5; from phthisis, 9.

Waterbury, 45,000, May, '99: Total deaths, 52; death rate, 13.8; from phthisis, 3.

DISTRICT OF COLUMBIA.—280,250, 4 weeks, July 8, '99: Total deaths, 448; death rates, white, 16.42; colored, 30.31: 23.36; deaths from typhoid fever, 5; diphtheria, 3; cerebro-spinal fever, 8; phthisis, 37; acute respiratory diseases, 17.

FLORIDA.—Forty-five counties and two cities, with a total population of 464,639, report for April, '99, 435 deaths, representing an annual death rate of 14.4 per 1,000. From typhoid fever, 6; consumption, 50.

ILLINOIS.—Chicago, 1,650,000, May, '99: Total deaths, 2,066; death rate, 14.54; from typhoid fever, 25; diphtheria, 55; croup, catarrhal, 6; phthisis, 238.

Forty physicians have given volunteer aid to the inspection and relief service of the Chicago Health Department this summer. The primary object of this volunteer work is the instruction of mothers and those in charge of infants, in the hot weather hygiene of children—their feeding, clothing, bathing and care—with a view of preventing disease. The correction of sanitary defects and the abatement of nuisances is also an important part of the duties of the service.

IOWA.—State Board bulletin for June reports infectious diseases for the preceding month:

Cerebro-Spinal Meningitis.—Linn Grove; Ottumwa; Davenport.

Diphtheria.—Dows; East Orange Township, Sioux County; Liberty Township, Hamilton County; Riceville; Alton; Harrison Township, Harrison County; Dunlap; Linn Township, Linn County; Des Moines; Dubuque; Le Mars.

Measles.—Sibley; Rockford; Dubuque; Marengo.

Scarlet Fever.—Alton; Correctionville; Lynnville; Kramrar; Harcourt; La Porte City; Lost Grove Township, Webster County; Liberty Township, Hamilton County; Wapello; Liscomb.

Smallpox.—Cresco; Rome; Orleans Township, Winneshiek County; Le Claire; Iowa City; Pleasant Valley.

Typhoid Fever.—Davenport; Des Moines; Ottumwa.

Whooping-Cough.—Slater; Keokuk.

Deaths in 14 towns, with an aggregate population of 275,905, 265; death rate, 11.5.

KANSAS.—New State Board of Health, appointed by the Governor May 6, 1899:

Regulars.—Dr. A. J. Morton, of Green, Clay County; Dr. S. J. Crumbine, of Dodge City, Ford County; Dr. S. W. Williston, of Lawrence, Douglas County; Dr. G. W. Hollenbeck, of Cimarron, Clay County.

Eclectics.—Dr. B. J. Alexander, of Hiawatha, Brown County; Dr. G. E. Locke, of Holton, Jackson County; Dr. A. S. Gish, of Abilene, Dickinson County.

Homeopaths.—Dr. Charles Lowry, of Topeka, Shawnee County; Dr. J. W. Minnick, of Wichita, Sedgwick.

The board organized June 14, as follows: Dr. J. B. Alexander, President; Dr. W. B. Swan, Secretary; Ina Colburn, of Topeka, stenographer. Dr. Gill, secretary of the preceding board, contests the election of Dr. Swan and purposes an appeal to the courts, relying upon the statute which provides that "the secretary to hold his office so long as he shall faithfully discharge the duties thereof; but may be removed for just cause at any regular meeting of the board by a majority of the members of the board."

LOUISIANA.—New Orleans, 300,000 (90,000 colored), May, '99: Total deaths, 862—311 colored; death rates, white, 26.24; colored, 34.56: 28.73. Deaths from phthisis, 77; cerebro-spinal fever, 12; typho-malarial fever, 3; typhoid fever, 6.

MARYLAND.—Baltimore, white, 463,000; colored, 78,000: 541,000. May: Total deaths, 752; 199 colored; death rates, white, 14.33; colored, 30.61: 15.85; 33 died from infectious diseases, 85 from consumption, 19 from bronchitis, 6 from influenza, 3 from typhoid fever. Infectious diseases reported during the month, 227, 33 more than preceding month.

MICHIGAN.—The Secretary reports for May, 1899, compared with the preceding month, measles increased, and pneumonia, influenza, inflammation of bowels and cerebro-spinal meningitis decreased in area of prevalence. Compared with the average for May in the thirteen years, 1886-98, cerebro-spinal meningitis was more prevalent, and whooping-cough, diphtheria, typhoid fever, consumption, pneumonia, remittent fever, erysipelas, inflammation of bowels and intermittent fever were less prevalent. Reports from all sources show consumption reported at 19 places more, measles at 16 places more, scarlet fever at 6 places more, typhoid fever at 3 places more, whooping-cough at 7 places more and diphtheria at 10 places less in the month of May, 1899, than in the preceding month.

The total number of deaths in Michigan reported to the Department of State for the month of May was 2,560, a decrease of 375 from the number returned for the previous month. The death

rate for May was 12.9 per 1,000 population as compared with 15.6 for April. There were 584 deaths of infants under 4 years. Deaths from important causes as follows: Consumption, 184; other forms of tuberculosis, 62; typhoid fever, 24; diphtheria and croup, 25; scarlet fever, 7; measles, 16; whooping-cough, 12; pneumonia, 199; diarrhœal diseases of children, 61; cerebro-spinal meningitis, 133; influenza, 34; puerperal septicaemia, 18; cancer, 92; accidents and violence, 135. The month was on the whole a very favorable one, the decline in the number of deaths from pneumonia, influenza and cerebro-spinal meningitis being especially marked.

MINNESOTA.—Minneapolis, 225,602, May, '99: Total deaths, 189; death rate, 9.35; from typhoid fever, 5; cerebro-spinal fever, 3; diphtheria, 3; phthisis, 25.

St. Paul, 215,582, May, '99: Total deaths, 160; death rate, 9.60; from diphtheria, 3; phthisis, 9.

MISSOURI.—St. Louis, 623,000, May, '99: Total deaths, 775; death rate, 17.76; from typhoid fever, 2; diphtheria, 15; cerebro-spinal fever, 25; phthisis, 91.

Kansas City.—200,000, May, '99: Total deaths, 217; death rate, 13.02; from diphtheria, 1; cerebro-spinal fever, 9; consumption, 9; pneumonia, 30.

NEW JERSEY.—Newark, 235,000, 4 weeks, June 24, '99: Total deaths, 290; death rate, 15.70; from diphtheria, 5; phthisis, 30.

Paterson, 115,944, May, '99: Total deaths, 181; death rate, 15.6; from typhoid fever, 2; diphtheria, 12; cerebro-spinal fever, 15; phthisis, 17.

Camden, 64,000. At the annual meeting of the Board of Health, June 26, Health Officer Leavit reported infectious diseases for the year: typhoid fever, 342 cases—33 deaths; diphtheria, 214 cases—58 deaths; scarlet fever, 141 cases—5 deaths; cerebro-spinal fever, 2 cases—1 death. Total number of deaths from all causes, 702.

NORTH CAROLINA.—Eighteen towns, population 135,203 (57,425 colored), report for May, '99, 201 deaths, 100 colored; death rates, white, 15.6; colored, 20.9: 17.8; deaths from consumption, 25.

OHIO.—Sanitary bulletin for June reports *smallpox* still prevalent. Since previous report 178 cases, 3 deaths.

From January 1, 1899, to June 17, there have been reported 1,266 cases and 25 deaths. This gives a total since the first outbreak in the State—April 6, 1898—of 1,935 cases and 30 deaths.

Cases and deaths of other infectious diseases from 52 places, with an aggregate population of 1,376,587: Diphtheria, 51 cases, 10 deaths; scarlet fever, 140 cases, 9 deaths; typhoid fever, 46 cases, 22 deaths; whooping-cough, 58 cases, 4 deaths; measles, 440 cases, 6 deaths.

Cleveland, 395,000, May, '99: Total deaths, 431; death rate, 13.0; from typhoid fever, 11; diphtheria, 2; phthisis, 12; bronchitis, 9.

PENNSYLVANIA.—School Directors as Boards of Health.—At the last session of the Legislature a law was passed which authorizes them to exercise the powers of a Board of Health in each township, and to make rules and regulations to prevent the spread of contagious or infectious diseases. Dr. Lee, Secretary of the State Board of Health, has issued a circular letter address addressed to the school directors throughout the State calling their attention to the law, and adds: "In view of the facts that smallpox at present exists in several sections of the State, that diphtheria is constantly prevalent, and that, with the approach of warm weather, there is a probability of the development of many nuisances of a character prejudicial to the public health, it is in the highest degree desirable that each school board, outside of cities and boroughs, should at once avail itself of the opportunity thus afforded for the protection of its own community against the ravages of contagious and infectious diseases.

"I beg you to note, however, that in order to enable yourselves to assume the additional powers conferred by this law, it will be necessary for each board to make certain formal representations to the Court of Common Pleas or to a law judge of the county in which the district is located, in accordance with the provisions of section 3, and to wait the approval of such court or judge.

"Upon receiving information from the secretary of any school board that such action has been taken, I shall take pleasure in forwarding copies of such laws and regulations as will need to be enforced, and circulars of information with regard to the prevention of epidemics and abatement of nuisances."

Philadelphia, 1,266,832, 4 weeks, June 24, '99: Total deaths, 1,706;

from typhoid fever, 57; cerebro-spinal fever, 10; diphtheria, 73; phthisis, 215.

"Wisdom Rebuking Folly."—On the new regime in the Bureau Health Service, the State Board of Health, at a special meeting, May 29, adopted the following:

"Resolved, That the State Board of Health and Vital Statistics earnestly deprecates the declared intention of the Director of Public Safety of the City of Philadelphia to conceal the presence and number of cases of smallpox, or any other communicable disease, in that city, and for the following reasons:

"First. Attempts of this kind invariably end disastrously, defeating their own object. Rumor always magnifies danger, creating suspicion, anxiety and panic. The publication of the exact truth indicates that the authorities are vigilant, possessing full knowledge of the facts of the case, and have control of the situation, thus engendering a sense of security and dispelling alarm.

"Second. The policy of concealment prevents those living in the immediate neighborhood of infected houses, or who may desire to visit such neighborhoods, from taking necessary precautions for their own protection, and in this way facilitates the spread of the infection.

"Third. This course would vitiate the vital statistics of the city and State, impairing their accuracy and value, and destroying the confidence of the national health authorities and of those of other States and cities in the trustworthiness of our returns. The latter will therefore hesitate to advise their citizens to visit a community which adopts the ostrich-like policy of burying its head in the sand in the presence of a danger, instead of frankly acknowledging and bravely facing it.

"Resolved, That the Board, however, desires to express its belief that the danger at present existing is not of a character to excite serious apprehension, its entire confidence in the ability and intelligence of the Health Department of the city, and its assurance that the efficient measures which have been inaugurated will speedily terminate this merely localized outbreak."

Pittsburg, 305,000, 3 weeks, June 24, '99: Total deaths, 321; death rate, 18.1; from typhoid fever, 11; phthisis, 29.

RHODE ISLAND.—State Board of Health Report for 1896. Population of the State, 393,891: Births, native (including all whose fathers were born in the United States, whether the fathers

were of foreign parentage or native), 4,461; foreign, 6,289: 10,750.

Marriages, native grooms, 1,950; foreign grooms, 1,377: 3,327.

Deaths, native, 5,294; foreign, 2,210: 7,504.

Rates per 1,000 of population: births, 27.3; marriages, 17.0; deaths, 19.1.

Contagious diseases reported during the year: diphtheria, 1,021 cases, 283 deaths; scarlet fever, 701 cases, 53 deaths; typhoid fever, 325 cases, 113 deaths; consumption, 846 deaths—11.27 per cent. of the total mortality, exclusive of 37 deaths from general tuberculosis, 4 from tubercular laryngitis, and 56 from tubercular meningitis.

The work of the Board during the year was "a continuation of the methods of study of various conditions pertaining to the health of the community." The water supplies were not materially changed. The number of vaults and cesspool wastes liable to pollute the Pawtuxet river, from which the water supply of Providence is drawn, have been reduced to a minimum. Some stable yards still in a position to pollute the river during heavy rains remain. Examination of the watersheds are made monthly, and chemical analysis of the water semi-monthly.

Examinations by the Board of samples of sputum from cases of suspected tuberculosis, for physicians only, have been continued with gratifying results. Examination of the swabbings taken from sore throats have also been made in behalf of physicians, in cases of suspected diphtheria. In many cases the bacteriological diagnosis has been confirmed after the clinical symptoms had thus been determined.

Under "Reports from Towns," Providence reports a large amount of work executed and under way, most notable the extension of the water service, the care taken against its pollution, as above referred to. This water is pumped from the Pawtuxet river into a storage reservoir upon a hill about one mile distant from which it flows into the city by gravitation, directly supplying a second reservoir within the city limits. The population of the city is estimated to be 161,800; average daily water consumption, 9,106,623 gallons: 56 gallons daily to each inhabitant.

Newport reports nothing done for the promotion of the public health except a small extension of the town's sewers, and the laying of sewer and water pipes on the property of and by the Jamestown Water Company. About two-thirds of the population have been supplied with water during the year. The aggregate length

of the sewers in Newport is about two and a quarter miles, with which only about half of the population are connected. The town has no legal Board of Health other than a committee of the Town Council.

"No special work designed to improve or promote the sanitary condition;" "There has been no work for the promotion of the public health;" "Nothing for the promotion of the public health," are the opening words of all of the town reports, except Woonsocket and Narragansett. Woonsocket reports an extension of the water supply and considerable work done for its protection. Narragansett adopted an ordinance regulating pipe connection with the public sewer, and ordered parties owning land adjoining Pier Pond to "cover up low places with loam."

Excepting Providence, all the reports are made by the Town Clerks—seemingly in default of local Boards of Health.

Appended are the medical practice laws and the secretary's report of their practicability, and the report of births, marriages and deaths, and of divorces, for the year 1895. Summed up:

Births, of native parents, 3,292; foreign, 4,760: 9,882.

Marriages, native, 1,649; foreign, 1,088: 3,497.

Deaths, native, 5,474; foreign, 2,061: 7,535.

Population of the State, 384,758. Birth rate per 1,000, 25.7; marriage rate, 18.2; death rate, 19.6.

Of divorces, the number granted during the year was 373—of 516 applications—19 more granted than for the preceding year. Ratio of divorces to marriages during the year was one to every nine and four-tenths; of applications, one to every six and eight-tenths.

SOUTH CAROLINA.—Charleston, 65,165 (36,295 colored), 3 weeks, July 1, '99: Total deaths, 133, 93 colored; death rates, white, 24.3; colored, 44.4: 34.3; from phthisis, 8.

TEXAS.—Denison leads a sanitary movement by forming a club for the promotion of the public health. "The Denison Sanitary and Improvement Club," early in June, adopted a pledge and ordered it circulated throughout the city, as follows:

"We pledge ourselves, first, to maintain order and neatness on the premises surrounding our own homes; second, to use our influence with friends and neighbors to induce, on their part, a like observance of sanitary laws.

"We further pledge ourselves not to make of alleys, streets and vacant lots dumping grounds for any kind of waste material; but, instead, to destroy on our own premises, or cause to be removed therefrom, everything of a combustible nature, and to keep that that cannot be so destroyed in receptacles inside the gates, to be removed by the garbage haulers.

"Each signer of this pledge is expected to contribute ten cents to the expense fund of the club."

Committees were appointed for the purpose of circulating the pledges and collecting subscriptions.

"Galveston is a dirty Town."—The "News" says so, and the "News" knows. And there, too, a sanitary league has been organized for the promotion of the public health. And Dallas follows suit. "The Cleaner Dallas League" has been organized and adopted an inspiring motto—

"Not Words, but Work."

The first step is declared to be a report from a majority of the physicians of the city emphasizing the importance of a sanitary sewerage system. And the Austin "Statesman" says of its town: "The city isn't as clean as it ought to be; it isn't as sightly as it should be, the ordinances are not enforced as they should be, they are not obeyed as they should be. But the blame doesn't belong to any one man or set of men. The health department, the police department, the aldermen—and the people—are to blame. If the people will really get in earnest about cleaning the city; if they will do what they ought to with respect to their own premises and demand of the officers that their neighbors do equally as well, the city will be kept clean.

"Now, let the citizens of Austin put aside their indifference to the necessity and profits of sanitation, get together and inaugurate an organized, intelligent and ceaseless war upon the twin evils of mossbackism and criminal disregard of the public health, unsightliness and uncleanliness."

Texas is evidently about to have a State Board of Health.

UTAH.—Salt Lake City, 70,000: Deaths for May, 53; death rate, 9.08; from zymotic diseases, 9; phthisis, 5.

WASHINGTON.—Seattle, 75,000, May, '99: Total deaths, 45; death rate, 7.20; from phthisis, 5.

WISCONSIN.—Milwaukee, 280,000, May, '99: Total deaths, 309; death rate, 13.02; from typhoid fever, 4; diphtheria, 3; tubercular diseases, 54.

Abstract of "Public Health Reports" for the five weeks ending July 14:

YELLOW FEVER.

Havana, Cuba, July 7: Two cases reported yesterday in different sections of the town, one near the water front. Source of infection not traceable in either case.

Santiago, June 15-July 10: 148 cases and 28 deaths.

Vera Cruz, June 1-29: 246 deaths.

Mexico, June 11-18: 2 deaths.

Bahia, May 6-June 17: 101 deaths.

Panama, June 3-23: 13 deaths.

Rio de Janeiro, April 21-June 19: 105 deaths.

SMALLPOX

continues to prevail extensively. Reported June 30 to July 14:

Savannah, Ga., June 3-18, 5 cases; Chicago, June 20- July 1, 3; Kansas City, June 10-17, 3; Louisville, Ky., June 23-July 6, 8; New Orleans, June 17-July 1, 4; Shreveport, June 17, 3; Baltimore, June 18 to 27, 17; Steelton, near Baltimore, June 28, 14; Boston, Mass., June 27-July 8, 3; Fall River, June 27, 1; St. Louis, Mo., June 19-26, 4; North Carolina, throughout the State, 68; Cincinnati, O., July 7, 2; Cleveland, June 24, 4; Portland, Ore., 4; Pennsylvania, in eleven localities, June 3-July 8, 149; Ponce, Porto Rico, 5; Virginia, four localities, 44: Walla Walla, 8; Benwood, W. Va., 1. Deaths from smallpox reported: Boston, 3; New York, 8; Cleveland, 1; Milwaukee, 1; Portsmouth, Va., 1; Los Angeles, 1.

PLAGUE.

In British India, during the week ending May 13, 1899, there were 323 plague deaths in the city of Bombay, as against 319 during the previous week. In Bombay the deaths were 620, as against 587 the previous week; in Kurrachee 199, as against 181. Outside of the presidency of Bombay the epidemic continues to decline. In Madras 10 plague deaths were reported. In Calcutta the cases and deaths were 82 and 62, respectively, as against 83 and 60. In Bengal 13 cases were reported in the district of Howrah, as against 16 during the previous week. In the Punjaub, in

the district of Jollunder, the plague cases have declined from 32 to 13. In the Kolar gold district the number of cases fell from 57 to 44; in the City of Mysore, on the contrary, the number has slightly increased, while in the district of Mysore only a few cases have occurred. In the City of Kurrachee, up to May 25, the total number of cases and deaths was 2,945 and 2,127, respectively. Advices of June 6 state the occurrence of 3 deaths from plague in Penang. Hongkong, China: During the week ended June 3 there were 92 cases and 97 deaths reported.

DEATH RATE IN TUBERCULOSIS.—Dr. Kohler, in his paper on tuberculosis, at the International Congress at Berlin for the prevention and cure of tuberculosis, stated that in Germany phthisis pulmonalis is responsible for 2.25 and, including various other diseases of the respiratory tract, which he considers generally due to tuberculosis, for 4.9, out of a total mortality of 21.8 per 1,000 annually. Of the various countries of Europe, England, Belgium, the Scandinavian countries and Italy, show the lowest, and Russia and Austria the highest mortality from consumption. In England the actual death rate is only 1,358 per million, as against nearly 4,000 in Russia. Of the fourteen largest civilized cities in the world London has the lowest mortality from consumption, with the exception of Naples and Buenos Ayres, the highest mortality being shown by Moscow, St. Petersburg, Vienna and Buda Pesth. Statistics fail to show that elevation above the sea level has any effect on the spread of tuberculosis, but the percentage is higher in towns and industrial districts than in the country. Tuberculosis is more destructive to males than to females, and, compared with other diseases, is responsible for the largest number of the deaths that occur between the ages of twenty and thirty.

THE BIRTH RATE IN EUROPE.

Scientists and statisticians of France have been for some time occupied with the question of the decrease of the birth rate in that country. This naturally leads to the investigation of the birth rate of the other countries of Europe, in order to find out whether France is the only country going down the scale. For this purpose the tables published by Signor Bodis, a prominent statistician of Italy, are of value; these tables have in fact been made the base of various investigations as to the movement of population. The order in which the countries of Europe are classed in decreasing series, according to their mean birth rate, is as follows:

1. Russia in Europe.
2. Hungary.
3. Servia.
4. Roumania.
5. Austria.
6. German Empire.
7. Italy.
8. Spain.
9. Finland.
10. Portugal.
11. Holland.
12. England and Wales.
13. Scotland.
14. Denmark.
15. Norway.
16. Belgium.
17. Sweden.
18. Switzerland.
19. Greece.
20. France.
21. Ireland.

Thus it appears Russia has the largest percentage of births and Ireland the smallest.

To find out whether in any of these countries the birth rate is on the increase or decrease the figures for each for different years show that in all except five the movement of natality is on a decrease more or less rapid. M. Vauthier, analyzing the figures obtained by Signor Bodis, draws the following conclusion as to the diminution of the number of births:

The country of Europe in which the decrease is most striking is England, including Wales, whose coefficient of decrease is 0.306 per 100; Scotland, whose mean birth rate is nearly the same, decreases but 0.027 per 100; and Ireland, whose birth rate is much smaller, decreases only 0.0233 per 100. Somewhat after England and Scotland, but before Ireland, are found Holland and Germany, having coefficient of decrease of 0.0244 per 100, followed closely by Belgium (0.0239). Then, passing by Greece (0.0209), one reaches France, whose natality decreases annually by 0.0179 per 100. After France comes Russia (0.0158), Sweden (0.0147), Switzerland (0.0128). Last are found, having less than 0.01 per 100, Denmark (0.0078), Austria (0.0077), Pomerania (0.0033) and Hungary (0.0024).

The countries in which the birth rate is on the increase and in the order in which they are named are as follows: Italy, by 0.0083 per 100; Spain, by 0.0040; and lastly Servia and Norway, with coefficients of 0.0017 and 0.0012 per 100, being thus nearly stationary.

BOOK REVIEWS.

DISEASES OF THE HORSE.—Special Report U. S. Department of Agriculture, Bureau of Animal Industry. Prepared under the direction of DR. D. E. SALMON, Chief of the Bureau of Industry, by DRS. MICHENER, LAW, HARBAUCH, TRUMBOURER, LIAUTARD, HOLCOMBE, HUIDEKOPPER, and DICKSON. Pp. 576. Elaborately illustrated. Washington: Government Print.

Doubtless one of the most valuable contributions to business interests ever issued by the Department. It has been prepared by chosen veterinarians of exceptional experience and competency in the several departments or sections into which the general subject is divided, thus comprising a thoroughness of treatment of the whole subject not common to ordinary treatises. However, while prepared with special reference to its practical utility to the farmer, as a safe and scientific guide, it is not intended to supplant or to dispense with the veterinarian. On the contrary, while it will enable the farmer to act intelligently during a waiting interval, when a veterinarian may not be immediately accessible, it is well calculated to aid him in the timely recognition of dangerous diseases requiring prompt and scientific treatment by an accomplished veterinarian.

YEARBOOK OF THE UNITED STATES DEPARTMENT OF AGRICULTURE, FOR 1898. 8vo; pp. 798. Illustrated. Edited by GEO. WM. HILL. Washington: Government Print.

A work of wide scope and of practical utility to farmers not only, but to all readers who would be abreast with the utilitarianism of the Department of Agriculture. Among the most useful and practical contributions to the well-being of the people generally is "Some Results of Dietary Studies in the United States," reproduced in full on other pages of this number. "Weeds in Cities and Towns," "The Hawaiian Islands," "The Danger of Introducing Noxious Animals and Birds," "Work in Vegetable Physiology and Pathology," "The Movement and Retention of Water in Soils," are the titles of other important papers, of which there are in all about thirty of more or less practical utility to all farmers, and of interest to all who would be versed in the scientific aspect of agriculture and its relation to other pursuits. There is besides

an appended directory of agricultural colleges and experiment stations, including a list of the principal officials in charge of them; of the managers of farmers' institutes; of national and State dairy officials; of the several associations of cattle, horse and sheep breeders; of the State veterinarians and health officers; of the forestry officers of the different States and of the forestry associations; of the officers of the horticultural and kindred societies, etc. In short, while it is to be taken for granted that the Yearbook is widely distributed to agriculturists, technically so called, it is a work of almost cyclopedic information on a variety of subjects.

PROCEEDINGS OF THE CONVENTION OF WEATHER BUREAU OFFICIALS. Held at Omaha, Neb., October 13-14, 1898. Prepared under direction of WILLIS L. MOORE, Chief U. S. Weather Bureau. Edited by JAMES BERRY, Chief of Climate and Crop Division, secretary of the convention. Pp. 184. Washington: Government Print.

This is a report of rare interest to all persons—above all to physicians—who take an interest in and would measure climate by an exact knowledge of its elements. It consists of special papers and reports on the Relation between the Weather Bureau and the Public; Forecasts and Special Warnings—subdivided into ten parts and considered by as many observers. Then follow some twenty papers—all by climatological practitioners—comprehending the elements of climate in detail of all sections of the United States and Territories, and the bearings of climate on special subjects, and the influence of particular elements of climate—climate and crop service, meteorology for the use of schools, atmospheric moisture and artificial heating, effect of forest clearing, etc., etc.

"DR. CULP'S CATECHISM ON SMALLPOX AND VACCINATION.—Especially intended for schools and the uninformed laity." By D. W. Culp, A. M., M. D. Tampa, Fla.

A little pamphlet of thirty pages, comprehending an admirable condensation and lucid description of the benefit of vaccination, eminently suited to its purpose and worthy of the largest possible distribution.

CONTEMPORARY LITERATURE.

THIEVERY EXPOSED.

EVOLUTION.

Editor SANITARIAN:

We beg leave to call your attention to the fact that in your issue of July, 1899, on page 55, you have republished a poem entitled "EVOLUTION," giving credit to the "Chicago Standard." This poem was originally published in "Harper's Bazar" for May 13, 1899.

We assume that this was through an oversight on your part, and that you will promptly publish in your paper a note giving credit to "Harper's Bazar" for the use of the matter referred to.

HARPER & BROTHERS.

Franklin Square, New York, July 8, 1899.

Another.

"A NEW METHOD OF WATERPROOFING PAPER."

Editor SANITARIAN:

On page 525 of THE SANITARIAN, June number, we find a note entitled "A New Method of Waterproofing Paper." Since the manufacture of paper in which gelatin and formalin solution is used is an infringement of Schering's U. S. patent, we would ask you to kindly make an announcement in your journal to that effect.

We beg to quote from letters patent No. 572,295, dated Washington, Dec. 1, 1896, the following from G. C. F. Hauser's patent, which has been assigned to The Schering Chemical Works:

"I claim as my invention—

"1. The herein-described waterproof composition, which consists of anhydrous formaldehyde gelatin free from photo-sensitive ingredients, substantially as set forth.

"2. The herein-described method of producing a waterproof gelatin composition which consists in subjecting the gelatin free from photo-sensitive ingredients to the action of a watery solution of formaldehyde, then removing the gelatin composition from the solution and then drying the same, substantially as set forth."

We also desire to inform you that the claims of Dr. Albrecht Schmidt in Berlin for the Formalin Lamp, as well as for the

method of producing formaldehyde gas, have been allowed, and this method is not limited to the employment of paraformaldehyde in the form of tablets or pastils. Hence the use of solid formaldehyde in any form in connection with any method by which the hot gases of combustion transform the paraformaldehyde into gaseous formaldehyde and are afterwards mixed with them, is an infringement on Schering's patent.

SCHERING & GLATZ.

58 Maiden Lane, New York, July 11, 1899.

THE AMERICAN CAMPAIGN IN THE PHILIPPINES.

Of all men in the United States at the present moment, probably John Barrett, former United States Minister to Siam, is the one best qualified by personal knowledge to discuss the Philippine situation. Mr. Barrett has spent the past five years in the Far East. Long before the Spanish War he had traveled over a large portion of Luzon and had visited the islands of other Philippine groups. In May, 1898, after Dewey had annihilated Spain's fleet in Manila Bay, Mr. Barrett returned and remained in the vicinity of Manila for seven months. Finally, after the fighting with the Filipinos began in February, he came back to the scene of hostilities, and only left to set sail for America in the middle of March. Mr. Barrett contributes to the "Review of Reviews" for July a summary of his impressions after all these months of experience and observation:

"If I were asked," he says, "what was my direct impression as to the results of our campaign so far, I could faithfully answer that, considering the shortness of time during which we have been operating, the character of the country over which we have had to fight, and the strength and organization of the enemy, which they had perfected through long months of waiting, it has been a thoroughly successful one. People in America, not understanding the conditions, expect too much. When we think that we made practically no campaign outside of Manila until the middle of March, that we have penetrated into the very heart of the enemy's country with a record of continuous successful engagements during the hottest and worst months of the year, it is more fitting that we should congratulate our forces on their splendid record. In view of all conditions, we cannot fairly expect that the end of the conflict should come before the next dry season. Let us be reasonably patient, keeping in mind the work that already has been

done, and give our commanders and soldiers that support and confidence which they desire and need. General Otis should be provided with all the soldiers he requires, and the people of the United States should stand by the Government in asking for volunteers if they are needed; but unless unforeseen developments follow, it is probable that General Otis will be able to carry the war to a conclusion with his present regiments recruited to their full limit."

"AMERICANISM."

For several years past the Catholic Church has been disturbed by a controversy over what has been called "Americanism," which has threatened to divide its adherents on both sides of the Atlantic into two parties, and which recently culminated in the publication of an authoritative pronouncement upon the subject by the Pope. To the July number of the "North American Review," Dr. William Barry, a well-known Catholic writer, contributes an article of extreme lucidity and force, in which he tells the history of the controversy, explains the questions at issue and defines the situation resulting from the final decisions of the Head of the Church. Dr. Barry explains how the false Americanism was fabricated:

"It has been constructed by men like M. Maignen, according to a simple but effective recipe, which consists in taking words apart from their drift and context, reading into them the maximum of false interpretation which they will bear, mingling therewith any extravagances which have been uttered by persons who have no sort of connection with the parties accused, and then crying triumphantly: 'Behold the latest plot against Rome!' M. Maignen finds that Cardinal Gibbons and Archbishop Ireland express their admiration for Isaac Hecker as an exemplary priest and sound American. It follows, by the rules of his peculiar logic, that they agree in every particle with Hecker's mysticism, to which they make no reference. Cardinal Gibbons, with the assent of his colleagues, the American Archbishops, is present at the Congress of Religions in Chicago, and opens it with prayer. It follows that he is 'indifferent' in matters of faith, and holds every religion to be as good as his own. Archbishop Keane reads a philosophical essay on the same occasion, in which he traces the idea of the Incarnation through various imperfect phases in heathen cults, until it is realized and wins the homage of mankind in the Person of Christ. At once he is set down as preaching a monstrous form of 'evolution;' he becomes the confederate of a certain 'Romanus'

whose articles are unknown to him, and whose temper and teaching he would be the first to repudiate. No matter; by dexterous—or shall we say, unscrupulous?—dovetailing into one of all these scattered elements, an 'American' theology is built up, which disowns the supernatural, sacrifices Catholic doctrine to the spirit of the age, and is the harbinger of Antichrist."

COMPARISON OF WORK DONE BY MEN AND WOMEN.

Among us to-day the instances are becoming more and more rare when a woman qualified to hold a position is rejected on account of sex. Wherever women do good work they are, as a rule, more or less gladly admitted. In science, art, and business, if they do equal work, they can earn an equal standing, though, perhaps, not yet always an equal salary.

In practical American life the place left for the non-producing consumer is small. Each one, if he would be felt, must bring a contribution to the bee-hive. Those who fall short of this are at a disadvantage, and the time must come when the workers must crowd them out. The spirit of our time weighs every individual by his practical value and every measure by its expediency. Utilitarianism is the tendency of our epoch, and "Does it pay?" is the American test.

The quick intuition and the keenness of perception of women in the past, notwithstanding their ignorance, have often won for them a commanding if indirect influence over public affairs—an influence, by the way, by the legitimate and dignified use of which both society and women themselves must be benefited. Higher education held out to all is rapidly raising the entire level of womanhood, and with it has come a higher conception of its dignity. The women of wealth who intelligently attend to their own affairs are becoming numerous, while few of those less favored are satisfied with the alternative formerly placed before them of resignation to poverty or dependence upon the bounty of others. The class of self-respecting and self-supporting women, married and single, is growing at a rapid pace. They not only hold an important place in the modern world of art and literature, but as teachers, bookkeepers, clerks, secretaries, stenographers, and operators they are finding their way into every business establishment.—Sara Y. Stevenson, in July "Lippincott's."

WHAT IS SCIENCE?

"Trained and organized common sense" is Prof. Huxley's definition of science. There is probably no better.

The popular mind persists in thinking that there is a wide difference between science and knowledge in general. Yes, there is a wide difference, but it is just the difference that there is between a trained and organized *body* of men for the accomplishing of some great work and a *crowd* of men unorganized and undisciplined. What unscientific knowledge has accomplished may be roughly seen in the condition of savage races to-day; while the changes wrought by knowledge trained and organized, in enlarging the sum of knowledge, in extending men's power of perception and in increasing the facilities not merely for living, but for living well, are changes in comparison with which all others recorded in history are trifling.

It will be profitable for us, in order to get a clearer idea of scientific method, to trace as briefly as possible the history of science and the development of the scientific idea.—From Scientific Method and Its Application to the Bible, by the Rev. David Sprague, in Appletons' "Popular Science Monthly" for July.

THE CARE OF THE EYES.

On arising in the morning the eyes should be bathed gently in cold water—twenty "passes" are said to be decidedly strengthening. While using them closely they should be rested at intervals of an hour or two, for the strain of constant reading or sewing is like that of extending the arms at a certain height immovable. Imagine then the taxing of the eyes, which cannot complain save after years of irreparable neglect. When dust settles in the eyes warm water will soothe them of any inflammation; rose-water is extremely refreshing, but it should be bought in small quantities, as it keeps but a short time. Five cents' worth will give a daily eye bath for several weeks. Tea leaves and alum-water were the eye tonics which our grandfathers used; but in these modern days of absolutely hygienic and antiseptic simplicity, water, especially in a distilled form, is considered powerful enough.—"Harper's Bazar."

THE CENTURY for July is a story-teller's number, and is novel in its make-up, not only because it has a large amount of original fiction by ten living story-writers, but because it contains also articles on seven of the world's most famous makers of fiction, two only of whom are living. In only one or two cases do these articles

consist of criticism. In most cases they are new material concerning the writers mentioned. For instance, two hitherto unpublished portraits of Sir Walter Scott, accompanied by a sketch of the artist who made them, are followed by a detailed and authentic acount of the romancer's unhappy love affair, which cast a shadow over his entire life. The author of this true story is a descendant of one of Sir Walter's intimates, the brother-in-law of his successful rival and life-long friend. Mrs. James T. Fields tells of a visit to George Eliot, and quotes unpublished letters from the famous novelist. "Stevenson in Samoa" contains such reminiscences as might be expected from the story-teller's stepdaughter and secretary. "The Making of 'Robinson Crusoe'" gives the true story of Alexander Selkirk and his sojourn on Juan Fernandez, with reproductions of his gun, his trunk, and other relics, and clears De Foe of the charge of having stolen his literary material from the original Robinson Crusoe. Victor Hugo as an artist is the subject of a paper by Le Cocq de Lautreppe, in which are reproduced several of the poet's hasty sketches and more elaborate designs. "Bret Harte in California" was well known by Noah Brooks, who fills several pages with entertaining gossip of a period that seems more remote than it really is. Half a dozen critical articles on famous fiction-makers follow. Most of these articles are fully illustrated, and there is an abundance of verse.

IN HARPER'S WEEKLY are now appearing four of the most valuable series of special articles of the year. Under the title "An American Sovereign," Julian Ralph writes of India, and of Lord and Lady Curzon in their new empire. "Hawaiian America," by Caspar Whitney, is a series that is invaluable to every American who is interested in Hawaii, in a commercial or industrial way. Mr. Franklin Matthews' description of "The Reconstruction of Cuba" is admirably clear and interesting. The same may be said of the work of John F. Bass, special correspondent for the "Weekly" in the Philippines. Another very interesting feature is the clever serial by Robert W. Chambers, "The Conspirators," in which the present Emperor of Germany, whom Mr. Chambers styles William the Sudden, comes in for much good-natured ridicule.

THE serial attraction of THE LIVING AGE for the summer months will be a story by "Neera," one of the best known of contemporary

Italian writers. It is called "The Old House," and the opening chapter, in the number for July 1, is full of color and romantic charm.

HARPER'S for July is especially interesting for the unusual number of short stories it contains, and in this respect is admirably suited to summer readers. Israel Zangwill contributes "Transitional," a touching story of how a little Jewess renounced her Christian lover for her father's sake. "The Wrath of the Zuyder Zee," by Thomas A. Janvier, is in many respects the best of Mr. Janvier's short stories. Frederic Remington is both the author and the illustrator of "The Honor of the Troop." "Matilda's Address Book," by Margaret Sutton Briscoe, illustrated by A. B. Frost, is one of the most entertaining features of "The Drawer." Jessie Van Zile Belden contributes "Not on the Passenger List," and Wolcott Le Clear Beard tells a pathetic story of a telegraph operator in a rough Western town. The Hon. Henry Cabot Lodge brings to an end the history of the war with Spain with an account of the Manila campaign. It is certain that this is, and will remain for many years to come, at least the standard history of the conflict of 1898. Senator Lodge writes with authority, and the position he held on the Committee of Foreign Affairs gives an added importance to his narrative. Senator Lodge has borne witness to the fact that there existed in official circles gross mismanagement and criminal negligence, and the fact that he held an important position gives weight to his statements. The work is in all respects an admirable piece of historical writing, and should take a prominent place in our historical literature. The fact that it has been so profusely illustrated by the best special artists makes it doubly valuable. Those who have not had an opportunity for reading it as it appeared in the "Magazine" will be glad to learn that it will shortly be issued in book form, and is to contain over eighty full-page illustrations besides numerous photographs. It is a book that should find an honored place in every American home as the lasting record of a most momentous war.

THE SANITARIAN.

SEPTEMBER, 1899.

NUMBER 358.

MEDICAL ASPECTS OF CRIME.*

Address on State Medicine, at the Fiftieth Annual Meeting of the American Medical Association, Columbus, Ohio, June 6-9, 1899.

By DANIEL R. BROWER, A. M., M. D., LL.D.,

Professor of Mental Diseases, Materia Medica and Therapeutics, Rush Medical College; Professor of Diseases of the Nervous System, Post-Graduate-Medical School; Professor of Diseases of the Nervous System and Clinic Medicine, Northwestern University Woman's Medical School, etc. Chicago.

ABSTRACT.

The limitation and treatment of crime is one of the great questions of the day. The closing hours of the nineteenth century are full of wonders. The progress in science, in literature and in art has been marvelous. Medicine and surgery have made mighty strides. The insane, the feeble-minded, the deaf, dumb and blind have received in these later years treatment that is scientific and successful. The care of the criminal is the one great question that baffles society, and great difficulties have arisen from the fact that the medical aspects of crime have not been sufficiently considered. Criminology of to-day is much in the same condition that psychiatry was when Pinel and Tuke appeared and wrought their memorable reforms, substituting patience and scientific treatment for brutality and chains. This transformation in the care of the insane was brought about by the medical profession, and it is our

*From the Journal of the American Medical Association, June 10, 1899.

duty to-day with equal zeal and earnestness to consider this question of criminality, find out its etiology, and provide means for its cure. Already the pioneers, Gall, Lombroso, Benedikt, Ellis, and a host of others, all physicians, have done a great work, the practical results of which are now manifest. They have established the fact that the habitual criminal is an abnormal man, the abnormality manifesting itself: 1, physicially in the criminal physiognomy, in stigmata of degeneration, in anomalies of the muscular, sensory, respiratory and circulatory systems, and 2, psychically, in moral insensibility, lack of forethought, low grade of intelligence, vanity and egoism and emotional instability.

In approaching the study of this subject we are first surprised by the rapid increase in crime—rapid much beyond the ordinary increase in population. The census reports of our own country show that in 1850 there was one criminal in 3,442 population; in 1860 there was one in 1,647 population; in 1870 there was one in 1,171 population; in 1880 there was one in 855 population; in 1890 there was one in 757 population.

These figures represent the prisoners that were incarcerated, and it has been estimated that only about one-third of them are thus disposed of. This being the case, the number of criminals in 1890 in the United States was about one-quarter of a million. The cost of maintenance, arrest and trial for them has been estimated at about $59,000,000. Now, these statistics, I may say, have been disputed by some criminologists, for the reason that they regard the census reports, prior to 1890, or possibly 1880, as unreliable. Even these doubters admit an increase in crime, objecting simply to the great increase. The statistics of the State of Pennsylvania confirm these national statistics.[1]

Population of State in 1880, 4,282,891; inmates of penal institutions, 5,449; defective classes, 6,070; sane in almshouses, 6,648: 18,167. In 1890: population, 5,248,574; inmates of penal institutions, 7,340; defective classes, 9,712; sane in almshouses, 6,905: 23,957. Per cent. of increase, 31.8.

The same is more emphatically true in New York City. The population of that city has increased in the last ten years about 33 1-3 per cent, while crime has increased more than 50 per cent. In Chicago the number of arrests for ten years has been: In 1884, number of arrests, 39,434; in 1885, 40,998; in 1886, 44,505; in

[1] Boies: Prisoners and Paupers. P. 10. G. P. Putnam & Sons, 1893.

1887, 46,505; in 1888, 50,432; in 1889, 48,119; in 1890, 62,230; in 1891, 70,556; in 1892, 89,833; in 1893, 96,976.

The consideration of these several reports can not leave the least possible doubt in the mind of any one that crime is increasing throughout the United States in a vastly more rapid ratio than is the population. The two great etiologic factors in the causation of crime are criminal parentage and environment. The effects of these two agencies are strikingly illustrated in the history of the Jukes family, as related by Dugdale.[2] The ancestor of this family, born between 1720 and 1740, lived to an old age and left descendants who have been traced with varying completeness through five generations. The total number of his descendants is 1,200. While it includes a certain number of honest workers, it has been a family of criminals, prostitutes, vagabonds and paupers, costing the public treasury about a million and a quarter dollars.

Another of these remarkable exhibits is the tribe of Ben Ishmael, studied by McCulloch.[3] He discovered and identified 1,750 descendants of this man living in Kentucky in 1870, who had been criminals and paupers, among whom 121 were prostitutes. In six generations 75 per cent. of the cases treated in the City Hospital in Indianapolis were of this man's offspring.

Professor Pelman, of Bonn University, has discovered and identified 709 descendants of Frau Ada Jurke, a notorious drunkard, who was born in 1740, and died in 1800. Of these 7 have been convicted of murder, 76 of other crimes, 144 were professional beggars, 61 lived on charity and 181 were prostitutes. This family has cost the German government for maintenance, cost of courts, almshouses and prisons, one and a quarter millions of dollars.

Similar studies would bring to light hundreds of just such cases, these three being by no means a remarkable exception in the procreative capacity of criminals and in the effect of parentage and environment.

An important factor in the cause of crime is intemperance. Fully 50 per cent. of the criminals arrested in Chicago are inebriates, and the police reports of New York show about the same proportion. As Macdonald[4] has well expressed it: "The saloon is the place where the criminal finds his accomplices; it is the abode

[2] The Jukes: A Study in Crime, Pauperism and Heredity. By R. L. Dugdale. G. P. Putnam & Sons, 1877.

[3] Boies: Prisoners and Paupers. Page 176. G. P. Putnam & Sons, 1893.

[4] Macdonald: Criminology. P. 88. Funk and Wagnalls Co., 1893.

where they not only meditate their crimes, but where they spend the money obtained by crime. The saloon is the true home of the criminal, and sometimes the keeper plays as backer."

Ferri[5] has shown beyond question that in France crime increases and decreases with the more or less abundant vintage, and we may safely attribute, at least, some of the increase of criminality and pauperism in the United States to the increase of intemperance, and we may estimate that alcoholics are the direct or indirect cause of probably 75 per cent. of all the crime committed. None to-day, I think, will gainsay Morel's statement that alcoholism has produced a demoralized and brutalized class of wretched beings, characterized by an early deprivation of instincts, and by indulgence in the most immoral and dangerous actions.

The constant and rapid increase of the urban population is another etiologic factor. The recent growth of cities is one of the phenomena of our social system. When our government was established a century ago, its first census showed only about 3.3 per cent. of the inhabitants of the country living in cities of 8,000 and over. The census of 1890 shows such an increase that 27.6 per cent. of our population is urban. None know better than physicians what this crowding together of people means; with the bad air, poor and insufficient food, impure water, children in the midst of want, misery, immorality and vice, it is no wonder that the increase in crime goes *pari passu* with the growth of a city.

The criminal laws and their unreasonable execution are another factor in the causation of crime. The code of to-day is largely the Roman code. In ancient Rome it did well because the death penalty was common. The Coliseum had to be furnished with material for the amusement of the citizens, and "to the lions" was a common sentence; and then Rome had her Tarpeian Rock from which the defectives could be hurled and thus disposed of before the State could be troubled by their presence. To-day, with the death penalty rarely enforced, and with no such cutting off of the supply of criminal material, the law contributes to its increase rather than to its diminution. One of the absurdities of the law is the frequent conviction of the same criminal, not only an absurd work, but an expensive and unprofitable one.

The case of Jane Cakebread of London, with her 269 convictions, is but an exaggeration of daily occurrences in our own courts.

[5] Ferri: Criminal Sociology. P. 117. D. Appleton & Co., 1896.

Jane Cakebread, like many of our own criminals, should have been convicted but once. Our jails are schools of crime. The delay of the law gives the children, sometimes arrested for trifling offenses, weeks and months of tutelage under old and often incorrigible masters in crime, even before their guilt or innocence has been established, and after conviction further instruction in the same arts, so that when they leave, after their brief period of restraint, they are experts and will do much damage to person or property before they are again sent up for further instruction.

Then, again, the laws are defective because they are directed against the crime and not the criminal, overlooking the important fact that the crime is an accident, and the criminal may be the product of a long line of etiologic factors, demanding for his cure, not punishment but reformation. The law says that if two men commit the same crime their guilt is equal, and the same punishment must be inflicted on both, overlooking the possibility that the one may be a hereditary habitual criminal whose whole life has been a war against society, and who is utterly incapable of reformation, and that the other may be simply the victim of circumstances, whose life previously may have been pure and noble. To the one man the prison may be a haven of rest; to the other, a living tomb.

The habitual criminal, who constitutes the great bulk of the class, is a biologic study, and his anatomic, physiologic and psychologic nature demands our most careful investigation, in order that we may determine the ways and means to settle the various and vast questions to which he gives rise. There is a criminal physiognomy, by no means easy to describe, but the same, no matter whether seen in our jails or in the jails of any other country on the globe. Any physician, by looking at the face, without being able to describe its anatomic peculiarities, can reach conclusions, as Mantegazza writes, on five important problems: 1. The condition of health or of sickness. 2. The degree of beauty or of ugliness. 3. The moral worth. 4. The intellectual worth. 5. The race. The study of physiognomy, regarded as of such great importance by the physician of the last century, is too much neglected by the physician of to-day.

Prognathism is a prominent characteristic of the criminal face. The lower jaw is often remarkably developed. Manouvrier found that while the average weight of the Parisian criminal skull is, if anything, below that of the ordinary Parisian, the jaw of the

latter averages 80 grams, and that of the former 94 grams. The prominence of the zygoma has been noticed by many observers, and anomalies of the teeth and jaw are common.

The ear is a feature of great importance. It is so sensitive to vasomotor changes, to extremes of heat and cold and to varying emotional states, that it is an organ which frequently shows degeneracy. Talbot thus describes the normal ear: "It should have a gracefully curved outline, be nowhere pointed or irregular, having a well-defined helix, separated from the antihelix by a distinct scaphoid fossa, extending down nearly to the level of the antitragus; its roots to be lost in the concha before reaching the antihelix. The antihelix should not be unduly prominent, and should have a well-marked bifurcation at its upper extremity. The lobule should be shapely, not adherent, not too pendulous, and free from grooves extending from the scaphoid fossa. It should not average over two and a half inches in length, and one and a quarter in breadth."

The ears of criminals show many deformities, such as Darwinian tubercles, absence of helix, of antitragus, of lobule, and excessive development of antihelix and of the tragus, and the auriculo-temporal angle undergoes a gradual progression from below 90 in the normal, above 99 in criminals, up to above 100 among apes.

The criminal nose has been measured and studied with great care by Ottolenghi. He finds that the criminal nose in general is rectilinear, more rarely undulating, with horizontal base of medium length, rather large, and frequently deviating to one side. He has established the anatomic relationship between the criminals, insane persons, epileptics and monomaniacs.

Pallor of the skin is common among criminals. Ottolenghi has investigated wrinkles on the faces of 200 criminals as compared with 200 normal persons, and found that they are much more marked in the criminals than in the non-criminal, that they occur much earlier in life and are of greater prevalence about the nose and mouth—that is, about the least contemplative and more material parts of the face.

The beard in criminals is usually scanty; as against 1.5 per cent. of absence of beard in normal persons, Marro found 13.9 per cent. in criminals, and a very large proportion as having scanty beards. On the contrary, the hair of the head is usually very abundant, often coarse and woolly.

The cranial capacity of criminals has been studied by many with diverse conclusions. The average size is probably about the same for the two classes. The cephalic indices are frequently an exaggeration of those of the race to which the criminal belongs. The auricular angles, which depend on the form of the cranium, give interesting results, as determined by Quatrafages,[6] Hamy, and confirmed by others.

Macdonald[7] has gathered together the following interesting facts in craniology: 1. Frequency of the median (or metopic) frontal suture. This character appears with brachycephalic heads and may be regarded as indicating inferiority. 2. The parietal or parieto-occipital sutures grow together earlier. Thus the parietal or occipito-parietal sutures are soon effaced, so the parieto-frontal and temporal. 3. The notched sutures are the simplest. This anomaly (as an interparietal bone in Peruvians and negroes) is considered by Anouchine as a sign of inferiority; it is normal in certain animals and constant in embryonic life. 4. The supernumerary or Wormian bones are frequent in the region of the median posterior fontanelle and of the lateral posterior fontanelles. 5. Other characters are the development of the superciliary ridges with the effacement or even frequent depression of the intermediary protuberance; the development of the mastoid apophyses. These characters are correlative with the great development of the temporo-parietal region, which in turn is related to the development of the jaw. 6. The backward direction of the plane of the occipital depression, as in inferior races, is more frequent in criminals.

Anomalies of the skull in criminals have been noted by many observers.

The brain weight of the criminal does not differ materially from that of the non-criminal. The potentiality of the brain does not depend so much on its size and weight as on its structure. The brain of Gambetta was very small, but very elaborately convoluted, so that it doubtless contained more and better neurons than that of the average person; one of the heaviest brains on record is that of a bricklayer who could neither read nor write. Flesch, out of fifty brains of criminals, did not find one without anomalies. From an examination of twenty-eight brains he found alterations in the meninges to the extent of 50 per cent. in the way of adhesions,

[6] Macdonald: Criminology. P. 49. Funk and Wagnalls Co., 1893.
[7] Macdonald: Criminology. P. 52.

various forms of meningitis, hemorrhage, atrophy and atheroma; these observations have met with abundant confirmation.

Benedikt, one of the most thorough and conscientious workers in this field of criminal pathology, found in an examination of nineteen brains of criminals a confluence of fissures. If we imagine the fissures to be water-courses, it might be said that a floating body in any one of them could enter almost all the others. While this type is not necessarily criminal, and while the criminal may have another type of brain, yet this is a type of low organization, an absence of brain substance because of the absence of connecting gyri. Benedikt also emphasizes the fissures which he terms the external orbital, very constant in apes, not commonly distinct in the human brain, but rarely absent in the criminal brain.

Another interesting anomaly noted by this observer is that the frontal lobe is sometimes divided into four convolutions instead of three, which he considers an evidence of reversion to the carnivorous type. Professor Benedikt has found other anomalies in brain structure in criminals. In a recent communication he writes: "As we know not the special psychologic values of these anatomic anomalies for the intellect, for the morality, for the esthetic sense and for the will, we must not be hasty with our conclusions, and principally with their application to individual cases or to special individual qualities. I insist always that from exceptional and atypic forms of the skull, as well as of the brain, we can generally deduce only the right of suspect of physiologic anomaly."

The feet of the criminal frequently show a tendency to revert to the flat floot of the lower races, and this is usually associated with a low instep.

The thyroid glands of the inmates of the Elmira and Pontiac reformatories were examined by Dr. Talbot, who has given me the following figures: Elmira, of 1,045 examined, 106 normal, 909 excessive, 36 deficient; Pontiac, of 465 examined, 145 normal, 183 excessive, 137 deficient.

Bono, in studying the eyesight of criminals, found 60 per cent. of 221 young criminals color-blind. Biliakow, who made similar tests on a hundred murderers, found 50 per cent. of them color-blind.

Tactile, temperature and pain sense are rarely normal in criminals. They are usually much diminished, especially pain sense. Anomalies of patellar tendon reflex are common; they are either exaggerated or very frequently absent.

In fifty autopsies, Flesch found 20 per cent. which showed affections of the heart so grave as to be the cause of death. On calculating accidental affections of the pericardium and endocardium the rate was 50 per cent. In this respect the criminal resembles the insane. Many of the manifestations of insanity are due to cardiovascular disturbances, and this might reasonably be expected, when we remember that the blood-supply of the brain is much more extensive than that of any other organ not concerned in blood-making or blood-purification.

The practice of tattooing is very common among criminals, and this, I take it, is remarkable, for one would suppose that among a class whose identity for their own sake should be concealed as much as possible such a practice would not exist at all.

On the psychic side of the criminal's character we find moral insensibility; a lack of forethought; a low grade of intelligence, vanity, egoism and emotional insanity.

The next important aspect of this question is the treatment; this should be based on etiology, to be scientific, and as criminal parentage and environment are the two great causative factors, the treatment should be directed against them. We should stop the propagation of crime. We should make it impossible for there to be any more Jukes, Ben Ishmael or Jurkes families, and to do this marriage should be regulated. There should be no possibility under the law for these people to marry and propagate their kind. Those who oppose the regulation of marriage contend that it would simply multiply prostitution, but multiplying prostitution does not necessarily mean, fortunately, promoting the propagation of criminals; for while the criminal man may have and does have remarkable virility, yet the prostitute rarely has the capacity of propagation. Very early in her career, by a wonderful conservatism in nature, her maternal passages become diseased to such an extent as to make conception almost impossible or very rare.

The operation proposed by Dr. Ochsner,[8] consisting in a resection of the vasa deferentia, does not mutilate the person; it does not destroy his sexual power, but it does prevent his power of propagation, and it is an operation attended with very little risk to life, and in my judgment it may be made a most useful agent in preventing an increase in criminals. Castration has been proposed by some, but the operation is vastly more dangerous. It is a great mutilation, and destroys sexual power, and for these sev-

[8] Ochsner: Surgical Treatment of Habitual Criminals. Journal, April 22, 1899.

eral reasons is by no means as useful an operation as the one proposed above.

The children of these degenerates should be taken in charge by the courts and placed at the very earliest possible age, certainly not later than 7 years, in a favorable environment, and by this means the great bulk of them might be made useful citizens. Alcoholism is a very important and exceedingly difficult etiologic factor to dispose of. The saloon is such a powerful factor in our political system that it seems to be impossible to have legislators enact laws that will properly regulate this great traffic. We see no way to accomplish any positive results except as physicians spreading information among the people as to the baneful influence of intemperance, and so educating the old and the young that the powerful influence of the great factor in politics may be neutralized. We need to-day legislation for inebriates; authority to place them in prolonged confinement, during which they may undergo such treatment as may be necessary for their cure, and we certainly need some legislation by which the traffic in alcoholics may be diminished, and by which the quality of the liquor furnished may be improved. But the best way out of it is not by prohibition at this time, surely, but it may be by a high license system. There should be some remedy provided against the constant increase in urban population. Some method should be provided for the restoration of the equilibrium, some way by which the unproductive citizen might be transported to the country and made productive.

The last etiologic factor—the laws and the unreasonable manner of their execution—demands such changes that those who are concerned in the sentencing of criminals should know something about their biologic condition, and surely the ordinary juryman can not possibly possess this knowledge. It would seem best, therefore, that the determination of this question should not rest with the ordinary juryman; that all sentences should be indeterminate; that the criminal should be sent to a prison or reformatory, not for any specific time, but until he is reformed or cured, precisely as the patient is sent to a hospital. A person who has committed his first offense should not be permitted to associate with hardened criminals; trials should be speedy and prompt. The pardoning power should be taken out of the hands of governors of States and placed under the control of a board of pardons, whose members shall be skilled in criminal anthropology. For criminal minor children there should be reform schools, where, through a

protracted period these children should be educated by manual training, and taught some useful occupation that may be to them the means of earning an honorable livelihood, and when the time comes for their discharge, they should be furnished with the means by which they may establish themselves in the occupation for which they have been trained. This is not an untried proposition, but is to-day in practice in Russia. There should be reformatories for the older criminals who are capable of reformation, and these also should be taught not only the rudiments of an English education, but useful arts, and their confinement should be until they are able to withstand temptation and earn an honest living, and when released from the care of the reformatory they, too, should be provided with a reasonable capital with which to make a start in life. And, lastly, for those who are incapable of reformation there should be penitentiaries for their life-long incarceration, and these should be made as near self-sustaining as possible by having the prisoners employed in useful occupations.

SPEAKING OUT IN DREAMS.

A tourist describing a visit to the Virginia Springs, in a Boston newspaper fifty years ago, when it was common for Southern ladies traveling to be accompanied by their maids, relates the following incident:

Just as the train enters the Big Tunnel, near this place, in accordance with the usual custom a lamp was lit. A servant girl, accompanying her mistress, had sunk in a profound slumber, but as the lamp was lit she awoke, and half asleep imagined herself in the infernal regions. Frantic with fright, she implored her Maker to have mercy on her, remarking at the same time, "The devil has got me at last." Her mistress, sitting on the seat in front of the terrified maid, was deeply mortified, and called upon her—"Molly, don't make such a noise; it is I, be not afraid." The poor African immediately exclaimed, "Oh, missus, dat you? Jest what I 'spected; I always thought if eber I got to de bad place, I would see you dar." These remarks were uttered with such vehemence that not a word was lost, and the whole coach became convulsed with laughter.

SANATORIA FOR THE TREATMENT OF TUBERCULOSIS.*

By FERDINAND HUEPPE.

Our knowledge concerning the prevalence of tuberculosis does not date from the most recent times. It is strange then that a definite and energetic struggle against this devastating disease has only recently been attempted.

As long as consumption was still considered, in the light of the old idea, as a constitutional disease, the struggle against it was undertaken partly as an attempt toward personal aid, but partly also with the idea that any effort against a constitutional disease would be in vain. Yet even then there was proof enough of the curability of consumption in the cases which had shown good results from a residence by the sea or in the mountains. The systematic development of these means for the purpose of sanatorium therapy and treatment in special institutions by Brehmer had shown, once for all, to those who carefully considered the subject, that phthisis was a curable disease. In addition, the success of surgical interference in another form of tuberculosis, and the observations of pathologists concerning the spontaneous healing of tuberculosis, tended further to strengthen the idea that tuberculosis was curable.

In spite of these experiences, no practical results toward the subduing of this disease as a true people's disease resulted. This is partly explained by the fact that the cures were obtained by means of hygienic treatment, in which diet and the hardening of the system played the principal parts. At that time the medical faculties could not concern themselves with such unscientific things, and so the ignorance of the practicing physician was only increased. One was taught in the clinics, it is true, how to auscultate most beautiful sounds and how to percuss dullness, but no one learned anything about treatment or cure.

Hygiene was then still in its infancy and had to earn for itself first a place in the university curriculum.

Interest in the disease had first to be awakened from another point of view before a connection with the old proven inquiries

*Read at the International Tuberculosis Congress in Berlin, May, 1899. Berliner Klinische Wochenschrift.—St. Louis Medical Gazette, July, 1899.

could be reached. The State and the people were no longer indifferent to a disease which was recognized as epidemic among them. Especially was this true since the occurrence of cholera. When, soon afterward, it was proven beyond any doubt that bacteria could be the cause of disease, and Koch brought forward the proof that tuberculosis was such a disease, there followed a stimulation in regard to these questions which no other former discovery had produced.

Now tuberculosis and its most frequent manifestation, phthisis, were recognized as true epidemics; more than this, the controlling epidemic of all civilized people. Our whole understanding of the meaning of the combat against tuberculosis should be regarded from this standpoint. Now the time had come when it was a simple duty and necessity to struggle against the disease energetically and definitely.

Several years were needed to perfect the diagnosis—a necessary preparation. The first activity in regard to tuberculosis, as in other epidemics, according to the hygienic principle, was merely defensive, and consisted in efforts to make the sputa as harmless as possible, and in general disinfection. The idea then was prevalent that the bacillus alone came into etiological relation with the disease, and therefore it alone, in the struggle against the disease, was worthy of consideration. Added to this was the hope that, by means of bacteriologic investigations, a cure would be found which would do away with the necessity of other precautions, or at least make them of secondary importance. This hope, unfortunately, was never realized, and bacteriologic orthodoxy even had to turn about and devote itself to other questions.

In the meantime a very important change, for the public welfare, had taken place in hygiene. Already in 1893 I had suggested that the exciting causes of a disease could only produce the disease when they acted upon a soil favorable to their development.

Further, I believed that the true internal cause of the development of a disease, upon a soil, is found in the constitution. To determine this medium, in special cases, is at present the highest duty of bacteriologic investigation.

This generally accepted fact of the relation between the exciting causes of disease and the soil upon which it develops, permitted the old medical experience to be proven, namely, that a certain disposition belonged to phthisical people. It is not merely the hered-

itary foundation which shows itself in the habitus phthisicus; there may be, also, much more minute local conditions of weakness.

I saw just lately in Cettinge, in the Black Mountains, a powerful man who fell seriously ill with a bacillary apex catarrh. In the mountainous regions, where we send our patients, the mountaineer cannot always even protect himself. In the early spring especially, when he is exposed to dampness and to sudden changes in the weather, his lungs may temporarily give way, as is often seen in pneumonia. The tubercle bacilli, which were before on unfavorable soil and thus were harmless, are now able to penetrate the tissue and multiply there.

Healthy persons can also carry tubercle bacilli upon the mucous membrane of the mouth and nose. It is thus proven in tuberculosis that mere contagion with the bacilli can not cause an outbreak of the disease. This only happens when a favorable soil, a disposition, a certain weakness exists. A knowledge of this fact is of the first importance in the treatment and cure of tuberculosis.

On the other hand, we, as hygienists, have observed in industrial centres that, together with the decline in resistance of all classes of a people, the number of tuberculous individuals increases also. Then, first with this condition, the number of tuberculous persons increases; meanwhile, on account of the tuberculosis already present, the danger from mere contagion threatens the people in city and country, and indeed there is scarcely any one who, sometime or other in his life, has not breathed in or swallowed living and infectious tubercle bacillus.

The fight cannot be directed against the bacilli alone, but in the first place against the soil of the disease. With this fact, the struggle advances from out the narrow confines of mere protective hygiene and comes to be a part of the care of public health.

This idea was suggested by myself and warmly defended and developed by H. Buchner. Our effort had then to do with a real question which could be solved, and the treatment and cure of those affected with tuberculosis appear to us as a part of a greater duty. The cure itself seems to us to take on the aspect of a public hygienic duty.

From the all-important standpoint of social hygiene, we have several duties to perform in regard to tuberculosis. In the first place, as a preventive measure, the number of the sick must be kept from increasing. In this, industry, factories and families must

aid, and by suitable precautions limit the uncontrollable spread of the exciting cause of the disease. This side of the question is scarcely appreciated and understood by the people at large at the present time, as is readily proven by observing the reckless expectoration on the floors of dwellings and public places. There is much yet to be wished for in the efforts to decrease the amount of dust in houses and factories.

Especially to be emphasized is the effort against the soil which is favorable to the disease. This leads us directly into the midst of the question of social hygiene. If the nutrition of the people who live in the country and to a less extent their houses leave much to be desired, in the city the dwelling is the main question. Until something radical is done on this point, almost anything we do will be in vain.

It is very important to have built in the city sufficiently large public parks, which give an opportunity to the people to enjoy recreation and amusement. Upon this point the schools and educational system must co-operate, so that the future generation may be strong and have good powers of resistance. This is really the whole thing in a nutshell, as far as the future is concerned, because not only can a soil favorable to the development of the disease be inherited, but also by means of correct living this can be overcome, and in the course of generations can be developed into the reverse condition. I cannot enter here more in detail in regard to this question. I have elsewhere expressed myself freely on this point.

The idea of a definite struggle against tuberculosis as a public disease forces us to conclude from these observations that this or that plan can only be partially successful. This applies also to the present movement for the establishment of sanatoria. Even in the beginning the founders of these resorts had wished that in connection with the sanatoria for the well-to-do, sanatoria for the middle and poorer classes might be established. The knowledge that tuberculosis could be cured outside of the so-called non-consumption zone made this hope a possibility. And already England and Germany possess quite a number of such institutions, while other countries in this regard are far behind.

The movement for the establishing of sanatoria has already accomplished one thing. There is no longer as much objection as formerly on their establishment, on the ground that they would introduce the bacilli into places formerly free from them.

Now it is well known that tuberculous people, provided they are clean in their habits, offer no danger to their surroundings. The sanatoria must first serve the purpose of practical social hygienic educational institutions, so that those who leave them may go forth as apostles of a wise method of living.

The sanatoria should not be so much tuberculosis hospitals as sanatoria in the best meaning of the term. The isolation should not result from a fear of bacteria or a lack of altruistic Christian feeling.

The isolation in sanatoria should only have this meaning: that there especial apparatus for treatment can be found, and that special hygienic methods can be carried out in the best manner, without any disadvantages.

From this it is evident that every large hospital should have a small sanatorium in connection with it for the tuberculous patients. In this way our whole system of hospitals would enter the general campaign against tuberculosis; first, by means of the correct treatment of the tuberculous, and secondly, by professionally educating the doctors to this end.

A limit is placed upon the special people's sanatoria on account of the expense. Society sanatoria could be built for those who belong to the less well-to-do class, if the local government would advance the small first cost; in this way many could share the advantages of these establishments to whom before such advantages were denied. In the course of time, perhaps, it will come that the large communities will build, in connection with their hospitals, departments for tuberculous convalescents and sanatoria. The central government is hardly in a position to join in the campaign by building sanatoria, as its activity is otherwise to be employed against the epidemic than by building hospitals. Only for the military, perhaps, should the State concern itself by building similar institutions in some health resorts.

The best way appears that those directly interested should build them for themselves. The great social law of the working classes, truly the greatest social feat of this century, has really made it possible and furnished the means for the erection of sanatoria. Thus a boon is given to the German working people, which no other people of the civilized world enjoy, and they do not have to depend upon the officious and boastful charity of single individuals.

In this manner the great groups of people most directly concerned will solve the sanatoria question. But it is well nigh im-

possible to treat in institutions all those who suffer from tuberculous disease. Such an ideal condition of affairs is mainly spoken of as a possibility in the enthusiasm of open meetings, but is soon forgotten when face to face with the stern reality.

Not all tuberculotics can be treated in sanatoria; many will seek cures in distant health resorts, and the majority, in the future, must of necessity be treated in the family.

The appreciation of the idea of sanatorian treatment, the hygienic therapy and the education of health must become the common good of the whole people. Before this can happen, however, it must become the common property of the physicians. Without this and without the aid of the medical profession a definite and systematic fight against tuberculosis will be in vain, because the few who are cured in the sanatoria have not the power nor are they sufficiently numerous to affect a large circle of people. The one who is an especially qualified expert and investigator among the laity, who accomplishes something permanent, is and remains the thoughtful and hygienically educated physician. He is absolutely necessary, and he must be the real director of the sanatoria if they are to fulfill their purpose.

The authority of the physicians in the sanatoria, at present, is too limited. The tailor, the glove-maker, the mayor and the city fathers have too much power, which results in limiting the activity of the physicians in charge and diminishes the respect due them. They even are allowed to exercise their authority in the matter of nourishment and the medical treatment of the patients. Such an improper state of affairs must be thoroughly altered if the sanatoria are to accomplish permanent good. The governing board should and must have its influence, but only in affairs which concern the executive management of the institution, and not in things which concern the sick.

For the patients, the responsible physician should be at hand and he should be regarded, from the outside also, as the sole and real director, and as such should be under the supervision of no one. Otherwise the confidence of the patients will be lost, and thereby the standing and the possible activity of the sanatoria will be most deeply injured.

There are many problems which concern the sanatoria themselves which must be solved, and which arise from the great length of time of treatment, and the physical condition of the patients. Moderate employment, amusements, lectures, card play-

ing, with the limitation as far as possible of gambling and drinking, are all important questions, and are difficult to decide wisely. The optimism of patients which causes them to attempt physical exercise, for which their strength is not adequate, is a further difficulty. Then it must be remembered that the religious needs of the patients must be considered.

Church attendance, especially in the unheated Catholic church, can do great harm, while, on the other hand, the altruistic spirit of the clergy will not permit Protestants and Catholics, and even Jews, to receive religious comfort in the same quarters.

After many discouraging experiences, one comes to believe that on this question little can be accomplished, and that nothing can be expected from the altruistic spirit of Christian belief. Yet this question must be considered, or a very uncomfortable state of affairs may develop. It is necessary, at least, to speak quite openly of this point.

There are many purely medical questions to be solved in the sanatoria. First of all is the alcohol question, and there is as yet among us great misunderstanding on this point. The majority of phthisical patients do not bear alcohol well, and their general nutrition may be seriously damaged by its use, and in the cure the most important element is the nutrition. What importance has the empty talk, that such and such a physician or director has found alcohol a benefit, and therefore allows it to his patients, against these facts? The physician in charge should be given the power, at least, to order total abstinence when and where he sees fit.

It is much worse in the public health resorts. There the physician may lose his position altogether if in relation to the alcohol question he regards the interest of his patients more than those of the saloonkeeper or the restaurateur. The public opinion must be awakened on this subject, so that this wrong in Germany and in most of the countries of middle Europe may be rectified.

Let the restaurant proprietors obtain their profits on other things, and not from those things that are directly harmful to the sick. At present the physician stands alone; the general public, without a proper understanding of the question, is on the side of the alcohol-enthusiastic landlord. The question of diet in the sanatoria presents many problems, which are more special in their nature; for example: overfeeding with albumen, fats, vegetables and salt. These questions are just as important in the sanatoria

as in the case of soldiers or laborers, only in the former the necessity for greater individualization makes the problem more difficult. Since the best food only should be employed, the question of cost is also a factor.

The location of the sanatoria and the streets leading to it should be determined in general, according to the rules laid down by Brehmer, and yet this is not always possible. Freedom from dust is the easiest problem, yet the presence of dust from the street makes many very excellent situations almost worthless.

Thus it can be seen that in the sanatoria there are many questions to be determined, and for their solution the interests of physicians of the administrative department and of the people must be roused and kept active.

The question of tuberculosis has many other phases.

The hygiene of public health resorts, the question of dust, the collection and the disposal of sputa, the roads for the sick, and the care of the common table, are all questions upon which there is much doubt. Yet how often does it happen that doctors send their patients almost anywhere, without knowing whether the place is suitable for their patients, whether they will have there the conditions best fitted for them and the proper care. Doctor and patient should consult together on such a question, because, needless to say, every place is the best place in the advertisements.

In addition there are many purely medical questions. All new investigations in regard to the etiology have confirmed the observations of Fischel and myself, that tuberculosis of mammals and chickens may be caused by a special variety of bacillus. The variability and modified growth of these bacilli are very puzzling.

The question of pseudo-tuberculosis has lately been opened by the studies of Rubner, Petri, Rabinowitsch and Zupnik. The interesting investigations of Moeller on acid-retaining bacteria have advanced the differential diagnosis and the general biology of the tubercle bacillus. The influence of climatic factors, wind, dust and cold, upon the resistance power is yet to be carefully investigated, and these investigations need for their solution bacteriologic study concerning the action of toxins, antitoxins, fluids, and cells upon the tubercle bacillus and the reaction of the latter upon the tissues of the animal body.

To that comes again the important question of the relation of tuberculosis to our domestic animals and their destruction. It is therefore seen that there is plenty of work to be done. These

labors need extensive measures to carry them out, and in addition the interest of wider circles, physicians, governments, and the people are in need of stimulation and of explanation in order that all may be led toward the solution of their problems. In this sense the present Tuberculosis Congress in Berlin should be enthusiastically welcomed. It is also evident that such social hygienic congresses find their limits in their international character. The duties which relate to sanatoria and public health resorts sketched above will be especially taken up in such a congress and will be their most important duty.

The more intricate questions, especially the purely medical ones, are less suitable to congresses of this nature, which aim to interest the general public and the governments. Therefore, the scientific questions should take on the form of popular expositions; if they do not, they will not fulfill their purpose; while the question of means and the relation to the labor protective laws deserves to have the greatest publicity.

Permanently then, in the campaign against tuberculosis, there should be a division of labor, and it is in the interest of the question to march separately and strike together.

The interest in the greater congresses would be soon exhausted if they come too often. The agitative addresses, from a distance, for the awakening of the interest on the whole subject, by the founders of public sanatoria, should be held only in intervals, if they are to be of use, otherwise they will have rather the opposite effect.

The detail work, however, should never cease. In this regard, active work, medical observation and experimental investigation should be continuously performed, and the communication and discussion of these things will interest and inform the general physician.

With this idea in view, in company with a few friends I have tried to bring about the first *definite and radical* organization for the struggle against tuberculosis in Germany. With this idea, we succeeded in having for the first time, in 1897, in Braunschweig, the Naturversammellung devote a special day for the consideration of the tuberculosis question, with the result that this meeting was the best attended one of the season. This success, which pointed out clearly and pertinently the necessity of the movement, encouraged us to go further. On my motion, the Naturversammellung in Dusseldorf, 1898, selected a permanent committee for the purpose of investigating and eradicating tuberculosis, which the fol-

lowing meeting, immediately upon its organization, declared to be of the first importance.

When an association of the importance and greatness of the German Association of Scientists and Physicians enters into a campaign of so purely a professional interest, and so useful for the common good, it is to be expected that their activity in regard to all these things which have to do with the same question will find appreciation and active support.

Our permanent committee, inasmuch as the Versamellung meets annually and in different places, has an incomparable opportunity to develop the agitation of the great congress. It has, since it includes doctors of all specialties, the possibility of spreading the understanding of all questions in the circle of doctors themselves. It has the possibility of quickly making the inspiration of scientists common property through lectures and demonstrations.

In this fact lies the justification and the necessity of the permanent committee of the German Naturforscher Versamellung.

Such a debate is more valuable, in the oldest and greatest of German scientific societies, than if it were given a special day in the numerous special congresses.

The suggestion of the Naturforscher Versamellung acts to better advantage in all points, and, therefore, develops further other meetings in a most happy manner. In the interest of the question, it is to be hoped that this action of the Naturforscher Versamellung should result in a further successful and useful activity. Our activities do not oppose great or even international congresses, which meet in long intervals, as the Berlin does, but adds to that a lasting and necessary development. Both undertakings can and must go together and work hand in hand if the truth of the thing is to be preserved.

May the Berlin Congress for the eradication of tuberculosis be granted a full and complete success.

THE PREVENTION OF TUBERCULOSIS.

At the National Conference of Charities and Correction in Cincinnati, May 18, 1899, Dr. GEORGE F. KEENE, of Howard, R. I., read a paper on "The Prevention and Treatment of Contagious Diseases by Municipalities." In part, as follows:

"Our present state of knowledge justifies the enunciation of the following law. Every new case of tuberculosis must be derived from another case of direct or indirect infection. The disease can only be transmitted from parent to offspring by transmission of the tubercle bacilli.

"This is a disease which has claimed more victims than all the wars and all the plagues and scourges of the human race. Even since the few short years since Koch's discovery, over 2,000,000 persons on this continent have succumbed to its fatal infection. In the last two decades right in Cincinnati, out of a total mortality of 119,089, there have been 17,353 deaths from this dread disease. The annual tribute of the United States to this scourge is over 100,000 of its inhabitants. Each year the world yields up 1,095,000; each day, 300; each minute, two of its people as a sacrifice to this plague. Of the 70,000,000 individuals now peopling these United States, 10,000,000 must inevitably die of this disease if the present ratio is kept up. It is confined to no race, it is limited to no country, but it is ubiquitous and universal.

"How long will the government and the people, and even the medical profession, remain apathetic to the ravages of a disease which is sapping the vigor of the race? The search for a specific remedy has been like the search for the Eldorado, which the Spaniards believed must have been found somewhere in the fastnesses of Florida. Ignorance and superstition have for ages shrouded the origin of this disease in impenetrable darkness. Not to know the true origin and methods of propagation of the disease has been the handicap of the century in its management, nor have the approved methods of treatment in the past in any way diminished the aggregate of its victims.

"So insidious is this disease and so impossible of detection has it been in its early stages, that it has been called everything from malaria to the grip, and has even been mistaken frequently for typhoid fever. But the present generation need make but few of those errors if it will but employ the exact methods of diagnosis already placed in our hands by the researches of a multitude of able and scientific minds.

"When we realize that the best time to deal with this disease, as with any other, in fact, is before we get it; when we realize that sanitation applied by the public and for the public is mightier in results than scientific medication in the most skilled hands of individual cases; when we realize that the life of each individual citizen is a public responsibility and this untimely death a public

misfortune—we will be ready to enter a public crusade against this scourge; and it is only by such a crusade that tuberculosis can be held in check.

"One of the prolific sources of infection from tuberculosis is the lower animals with which man is associated. We are a meat eating nation. In no other country, except Australia, is the animal per capita consumption of meat so large—being 119 pounds for us Americans and only 105 pounds for the beef-eating Britons. That meat from tuberculous animals is capable of producing tuberculosis has been demonstrated by scientific experiment. We cook our meat, but the lovers of rare roast beef and rare steak or even bologna sausage will probably often take into their stomachs many tubercle bacilli whose vitality has been unimpaired.

"But what are we to say of the thousands of infants that die annually from tuberculous cows? Milk is one of the chief infected foods which we obtain from the lower animals, and is the only food which we consume uncooked. The milk supply of a municipality should be as carefully watched as its water supply. It behooves us to know whether the cows that furnish the supply are tuberculous—to know whether they are fed on swill, the refuse from breweries or sour and fermented ensilage, for all ensilage at its best contains a large percentage of acetic acid.

"The people must be taught that the chief agent of contamination in the human family is the sputum. It has been estimated that a patient in whom this disease is but moderately advanced throws off from his lungs by expectoration four and a third billions of the germs of this disease every twenty-four hours. Dry expectoration soon becomes dust, and dust which the wind 'bloweth where it listeth.' Tubercle bacilli in dust have been shown by Dr. Stone, of Boston, to retain some of their virulence for at least three years.

"The cure of this disease has almost been a forlorn hope for ages. We know, however, that not a few have recovered completely from tuberculosis, as every pathologist can testify, for he has indisputable evidence of the fact in the cicatrized lungs he has seen, showing that they have healed after partial disintegration from the disease. Cure of this disease has been due to fresh air and a generous diet sometimes, perhaps, in spite of treatment. Consumption is an indoor disease. Where sunlight and pure air are bountifully enjoyed there tuberculosis can find but little lodgment.

"Let every means be employed to stimulate public charity. Let societies be organized everywhere for the prevention of this

scourge and to encourage philanthropic bequests for the building of sanatoria, for charity must be the ally of education in this great struggle. Let us, then, bear constantly in mind that it is no small part of our mission to save the individual from himself and the contamination of others; to institute and accomplish that bodily regeneration so vital to reforms; to preach everywhere the gospel of cleanliness, so essential in good morals; to drive contagion out that seeks consort with vice, ever remembering that we must be surveyors of the highway of health as well as pilots in the storm of disease."

THE DEATH-DEALING LONG-TUBE NURSING-BOTTLE.*

By ERNEST WENDE, M. D., of Buffalo, N. Y.

It is not my intention to enter into a controversy on infantile mortality from diarrhœal diseases, its deplorable rate, and the causes which are responsible for it. These latter have been carefully studied, and are, briefly: bad air, summer heat, ignorance of simple hygiene, and especially artificial feeding.

To the correction of all these possible factors have been directed the efforts of municipal authorities, the medical profession, societies, philanthropists and others. Tenement-house construction has been corrected and regulated by ordinance, the evils of the heated term mitigated by fresh-air missions, free ice and the like, maternal ignorance enlightened by educational circulars, and, finally, sanitary protection has been given to milk from dairy to nursery, as has been extended to no other industry, and this largely, if not almost entirely, with the interest of infantile feeding in mind.

With regard to diet, the child should live on food provided for it—milk—the only food which contains all the principles essential to life and growth. The infant structures grow by selecting with unerring accuracy, from the blood, the materials akin to their own composition. For the first six months the child should draw his supplies exclusively from the maternal fountains. When, however, the full and finely-chiselled bust of napkins or towels, the mam-

*Presented to the Section on Diseases of Children, at the Fiftieth Annual Meeting of the American Medical Association, held at Columbus, Ohio, June 6-9, 1899.—From the Journal of the Association, Aug. 5, 1899.

mary gland of the mother of to-day, is insufficient for the performance of its functions, we must have recourse to lacteal glands less esthetic and beautiful—those of the cow, goat, or ass—in preference to the wonderful feeding stuffs now so largely advertised in the daily and medical journals. An honest farmer who pastures his own cows on a healthy farm is the man to be employed to furnish milk to the poor little baby who has to seek another dairy than his mother's. And if the milk is not sweet, fresh and pure, pathologic changes will be developed, thereby rendering the gastro-intestinal tract more susceptible to irritants, and the production of cholera infantum results—when the baby gets beyond hygiene and enters the domain of medicine.

While all these causes of diarrhœal disease in infancy have, as stated, been carefully studied and their influence minimized, and while also the so-called long-tube nursing-bottle has been condemned, the extent of its evil possibilities, from its intrinsic construction, has been in part elaborated.

It is almost needless to state that an infant previously enjoying an environment of continual warmth and moisture, entirely devoid of infection, that was aseptically and insensibly nourished by osmosis should not have a hose several inches in length, remarkably efficacious for the propagation and the passage of pathogenic micro-organisms, placed in direct communication with its very susceptible, excitable and over-sensitive stomach. Facility of access is the only recommendation attaching to such a plan, but this is altogether outweighed by the terrible risk necessarily involved. Decidedly its only use and adaptability to lessen the danger of infection is its employment for the flushing of the lower bowel of the child.

The object of this paper is to briefly give the perilous and untrustworthy features of the so-called long-tube nursing-bottle, and to show justification for not only interdicting it, but doing so by law. Something definite should be aimed at and done to protect and save the helpless offspring of the ignorant and indifferent. The myriads of little ones it has already slaughtered should be sufficient to inspire us to enact elaborate laws, to be administered with the greatest care and strictness, in order to prevent parents and those in charge of infants from committing a variety of acts inconsistent with duty, judgment and common sense—for there is more virtue in the power of law than in circulars of instruction or education.

The chain of protection sought to be placed against these most

prolific sources of cholera infantum is no stronger than its weakest link, and this weak link has been the apparently innocent but death-dealing long-tube nursing-bottle. No factor has been more deadly, none so subtle as this device. Conceived in the interest of labor and time saving, appealing to the poor and overworked housewife, it has invaded the home under false pretense as has no other appliance, but has left in its trail a record of mortality. Its dangerous possibilities, now well known, have caused the physician to taboo it for some time, yet its convenience has been so great and its innocence so reasonable, that its apparent merits have, in only too many instances, been considered above the warnings against it. So certain is its malignant bearing on the artificially fed infant that its manufacture, sale and use should be prohibited by law, and, recognizing this fact, it has been so interdicted by the Buffalo Department of Health.

The peculiar features of danger from its employment may be summarily stated, that owing to its construction and material, and to the use to which it is put, probably no better incubator of pernicious micro-organisms and their toxins could be easily designed, as none have proven so successful. To the details, which render this statement plausible, your attention is asked, as well as to the experimental work which has been done in absolutely demonstrating, step by step, the vicious results created by the utilization of this contrivance, and how and why it is vicious; why it should, in all communities, be condemned and prohibited. Its popularity and foothold have been so strong that it also has had a commercial significance, and its abolition in Buffalo has not been without remonstrance and even the cloud of possible litigation. With the elimination of this, the greatest source of artificial infant-food contamination in the household, with a judicious observance of sanitary care of milk in homes, as supplementary to official surveillance of possible and preventable causes, it is not visionary to expect a reduction in death-rates in proportion as efforts based on our present knowledge can be made effective.

As milk is an almost universal food for bacteria, its reception in a rubber tube, acquired from a coagulum that is normally cavernous and unstable, invariably presenting surfaces that are rugose and unpolished, rendering asepsis an impossibility, must necessarily augment the conditions favorable for the growth and development of micro-organisms, and finally convert it into a nursery which produces conditions favorable to cholera infantum.

To establish, beyond peradventure, the danger of these tubular thoroughfares for the introduction of pathogenic microbes into the infantile economy, and the justification of suppressing them by legislation, I, as a health official, resorted to a series of investigations, microscopically, bacteriologically and chemically. The microscopic examinations of transverse sections, cut from unemployed rubber tubes taken from nursing-bottles procured at the various drug stores of our city, revealed the fact that they were manufactured out of rubber sheeting cemented together at their longitudinal margins to complete the tubes, and the seams thus formed were found unfailingly imperfect in their construction, showing, throughout their entire length, elongated pits and sinuses, which, in their functions, can only be likened to our modern bacteriologic "breed ovens." In some instances, this state of affairs was further intensified in that the tubes were constructed of more than one layer, between which such enormous spaces were frequently developed, directly connected with the lumen of the tube by the numerous pits and sinuses referred to, as to more or less involve their entire circumference. Moreover, the sections likewise demonstrate that the material used in the manufacture of this tubing is exceedingly porous, and that the pores vary amazingly in size and shape. Again, pockets were often seen communicating with the inner surface of the tube, while, in several specimens, distinct channels were visible connecting similar pits or pockets with cavities in the substances of the rubber. It would, indeed, be difficult to imagine a more efficient arrangement for the propagation of germs.

By reflected light, under the microscope, the inner surfaces exhibit a view apparently made up of roughened and scraggy elevations and depressions with many openings and clefts, extending deeply into the texture. All the features of the imperfect seams, by this means, are easily discernible and can be readily traced and studied throughout their entire length. Therefore it is obvious that any foreign material, gaining entrance to this perilous combination of pits, sinuses and porosities, cannot be removed by any of the ordinary methods of cleansing, however vigilant and faithful be the mother or nurse. Yes, it is extremely doubtful whether bacteria, when once lodged in these incubators, can be displaced or even destroyed by any known germicide or chemical.

From the bacteriologic examination of an infected rubber tubing, we were able to recognize a deposit of decomposing material

coating the inner surface, being the thickest in those portions of the lumen in close proximity to the nipple and glass tubing. This debris was found, on further investigation, to consist of coagulated casein, with innumerable bacteria of varied morphology. The qualitative bacterial examination of the material demonstrated the bacillus acidi lactici to be the predominating organism. The staphylococcus pyogenes aureus and ouidium albicans, with three other distinct species, two of which belonged to the non-chromogenic bacilli, the third being a chromogenic micrococcus, were present, and in addition several species not yet completely isolated.

Five decigrams of this grumous conglomeration, dissolved in 2 c.c. of sterile water and injected intraperitoneally into each of three full-grown guinea-pigs, weighing respectively 200, 254 and 261 grams, produced death of the animals in from forty-eight to sixty-one hours.

Segments of the infected rubber tubing were placed in small vials, and kept in an incubator at a temperature of 98.5 F., for twenty-one days, after the lapse of which time the specimens thus prepared were either in part softened or completely disintegrated, while, on the other hand, like pieces of the infected tubing, soaked for a few moments in a 5 per cent. solution of carbolic acid and subjected to the same temperature, were not similarly affected. The inference drawn from this experiment verifies the fact that the prolonged effect of decomposed milk on rubber will mash, mangle and disintegrate it.

In further unraveling the chain of morbid sequences, it was found, on a chemical analysis and investigation, that this process of decomposition and divulsion was due to the fermentation of the lactose of milk remaining in the tube.

An intimate part of the tubular mass consisted of zinc oxid as a filling, which, in the cheaper grades, was considerable in amount. This component substance, under the influence of the bacillus acidi lactici, and probably some other bacteria, supplied one of the conditions favorable for the continuous production of lactic acid, while the other condition was the presence of stale milk in the lumen of the tube. At the ordinary temperature, these microorganisms decompose the lactose, giving an interchange of elements as follows:

$$C_{12}H_{22}O_{11}+H_2O=C_3H_6O_3.$$

However, a certain degree of acidity puts a stop to the growth of the bacteria and to the production of acid, but if the acid is neu-

tralized, as formed by zinc oxide, as in this case, the decomposition is a continuous one. The casein was also more or less decomposed, which gave rise to bad-smelling products that remained in solution or else passed off in the form of gases. The presence of the zinc lactate, thus formed, which was soft and hygroscopic, coupled with the other soluble casein products, rendered the rubber doughy, indicating further injury dependent on micro-organisms.

In conclusion, I must insist that there are most rational grounds for believing that this mechanical invention, the long-tube nursing-bottle, should be considered as a premeditated plan for the poisoning and killing of infants, demanding special treatment by law.

Discussion.

Dr. F. P. NORBURY, Jacksonville, Ill.—The ordinary nipple is open to many of the objections which are applicable to the long tube. In the average nipple that is molded, after being used for some time there will be a crease running the whole length of the nipple—on a line at which the two halves are united. This is to be seen by turning the nipple wrong side out. This becomes an excellent nidus for bacteria. I have seen, in consultation, several cases of poisoning resulting directly from the use of such nipples.

Dr. A. C. COTTON, Chicago.—I would like to ask Dr. Wende whether he has made any microscopic examinations of the nipples as well as of the tubes.

Dr. ERNEST WENDE.—The nipples are subject to the same objections as the tubes. However, they can be inverted and thus are more easily cleansed. It is customary to recommend that two nipples be employed, same to be kept in a solution of bicarbonate of soda, and used alternately. It may be too early to speak concerning the wisdom of this ordinance, yet the death-rate in the city of Buffalo was diminished just one-half, as compared with the year previous to the enactment of the said ordinance. Our statistics are based on the number of those who died from cholera infantum, for they demonstrate that the majority of deaths occurred among those who use the long feeding-tube.

NATIONAL QUARANTINE AND STATE AUXILIARY SANITARY SERVICE.

HOUSE BILL 4363—FIFTY-FIFTH CONGRESS, SECOND SESSION.

Introduced by Mr. Hepburn, December 9, 1897. Reported with Amendments April 30, 1898, as follows:

A BILL amending "An act granting additional quarantine powers and imposing additional duties upon the Marine Hospital Service," approved February fifteenth, eighteen hundred and ninety-three.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That "An act granting additional powers and imposing additional duties upon the Marine Hospital Service," approved February fifteenth, eighteen hundred and ninety-three, be amended by striking out the following words in section one: "And with such rules and regulations of State and municipal health authorities as may be made in pursuance of or consistent with this act," and striking out section three and inserting the following in the place of said section:

"That immediately after the passage of this act the Secretary of the Treasury shall make such rules and regulations as are necessary to prevent the introduction into the United States of any infectious or contagious disease from any foreign port or place, or the spread of such diseases from one domestic port to another, and such necessary rules and regulations as shall be observed by vessels or vehicles departing from foreign ports or places for ports or places in the United States to secure the best sanitary condition of such vessels or vehicles, their cargoes, passengers, and crews, which rules and regulations shall be published and communicated to and enforced by consular, quarantine, and customs officers of the United States and the State and local quarantine officers of the United States. All rules and regulations made by the Secretary of the Treasury shall operate uniformly, so far as climatic conditions will justify, in the interest of security against the introduction or spread of said infectious and contagious diseases, and shall not discriminate against any port or place. None of the penalties herein imposed shall attach to any vessel from a foreign

port, or owner or officer thereof, until a copy of this act, with the rules and regulations made in pursuance thereof, has been posted up in the office of the consul or other consular officer of the United States for ten days in the port from which said vessel sailed, and the certificate of such consul or consular officer, over his official signature, shall be competent evidence of such posting in any court of the United States.

"At any port or place in the United States where the Secretary of the Treasury shall deem it necessary for the prevention of the introduction of contagious or infectious diseases from a foreign port or place that incoming vessels, vehicles, or persons shall be inspected by a national quarantine officer, such officer shall be designated or appointed by the Secretary of the Treasury, on recommendation of the Surgeon-General of the Marine Hospital Service, and at any such port or place no vessel, vehicle, or person from a foreign port or place shall be admitted to entry or enter without the certificate of said officer that the United States quarantine regulations have been complied with.

"Any vessel sailing from any foreign port without a United States consular bill of health, and arriving within the limits of any collection district of the United States, and not entering or attempting to enter any port of the United States, shall be subject to such quarantine measures as shall be prescribed by regulations of the Secretary of the Treasury, and the cost of such measures shall be a lien on said vessel, to be recovered by proceedings in the proper district court of the United States and in the manner set forth above as regards vessels from foreign ports without bills of health and entering any port of the United States.

"National quarantine stations now in operation shall be conducted in accordance with the provisions of this act, and the Supervising Surgeon-General, with the approval of the Secretary of the Treasury, is authorized to designate and mark the boundaries of the quarantine grounds and quarantine anchorages for vessels, which are reserved for use at each United States quarantine station; and any vessel, or officer of any vessel, or other person, trespassing upon such grounds or anchorages, in disregard of the quarantine rules and regulations, shall be deemed guilty of a misdemeanor and subject to arrest, and, upon conviction thereof, be punished by a fine of not more than three hundred dollars, or imprisonment for not more than one year, or both, in the discretion of the court.

"And any master or owner of any vessel, or any person violating any provision of this act or any rule or regulation made in accordance with this act, relating to inspection of vessels, or relating to the prevention of the introduction of contagious or infectious disease, and any master, owner, or agent of any vessel making a false statement relative to the sanitary condition of said vessel or its contents, or as to the health of any passenger or person thereon, shall be deemed guilty of a misdemeanor and subject to arrest, and, upon conviction thereof, be punished by a fine of not more than five hundred dollars, or imprisonment for not more than one year, or both, in the discretion of the court.

"Medical officers of the United States, duly clothed with authority to act as quarantine officers at any port or place within the United States, and when performing such duties, are hereby authorized to take declarations and administer oaths in matters pertaining to the administration of the quarantine laws and regulations of the United States.

"The Secretary of the Treasury shall, whenever in his judgment it is necessary, make rules and regulations to prevent the introduction of infectious or contagious diseases into one State or Territory, or the District of Columbia, from another State, Territory, or the District of Columbia, and when such rules and regulations have been made they shall be promulgated by the Secretary of the Treasury and enforced by the sanitary authorities of the States and municipalities when the State or municipal authorities will undertake to execute or enforce them; but if the State or municipal authorities shall fail or refuse to enforce said rules and regulations, or other rules or regulations made under the provisions of this act, the President shall execute and enforce the same, and adopt such measures as in his judgment shall be necessary to prevent the introduction or spread of such diseases, and may detail or appoint officers for that purpose: *Provided, however,* That nothing in this act contained shall be so construed as to authorize the Secretary of the Treasury to interfere with the State or municipal authorities in the regulation of local affairs so long as the introduction and spread of diseases are properly controlled and treated: *Provided further,* That there shall be no interference with authorized medical officers charged with the duty of carrying out the authorized regulations, who shall be permitted to freely pass with such property and appliances as may be designated in such regulations, from State to State and from point to point in a

State, and remain at such points as long as may be deemed necessary to properly control all infected places and treat such infection and prevent the spread of the same.

"Whenever yellow fever, cholera, plague, or typhus fever has passed the quarantines of the United States, or in any manner any one of these diseases has gained entrance or has appeared within the limits of any State, Territory, or the District of Columbia, the quarantine regulations of the United States, prepared under the direction of the Secretary of the Treasury, shall be supreme and have precedence of State or municipal quarantine laws, rules, or regulations, and the President is authorized to enforce the same within the limits of any State, Territory, or the District of Columbia, and to control the movement of vessels, railway trains, vehicles, or persons within any State, Territory, or the District of Columbia, to prevent these diseases from spreading from one State, Territory, or the District of Columbia, to another State, Territory, or the District of Columbia, and to prevent unnecessary restrictions upon interstate commerce; and whenever, in accordance with the rules and regulations made as herein authorized to prohibit or permit the movement of vessels, railway trains, and vehicles, or transportation of persons, prohibitions or permits have been made or granted, any persons violating said prohibition or permit shall be deemed guilty of a misdemeanor, and shall be subject to a fine of not more than five hundred dollars, or imprisonment for not more than twelve months, or both, at the discretion of the court; and any violation of said prohibition or permit shall be reported to the United States district attorney for the district in which the offense has been committed, who shall thereupon institute necessary proceedings for the recovery of the penalty herein imposed."

That section six of said act shall be amended to read as follows:

"That on the arrival of an infected vessel at any port not provided with proper facilities for treatment of the same, the Secretary of the Treasury may remand said vessel, at its own expense, to the nearest national or other quarantine station, where accommodations and appliances are provided for the necessary disinfection and treatment of the vessel, passengers, and cargo; and after treatment of any infected vessel, or inspection of any vessel not infected at a national quarantine station, and after certificate shall have been given by the United States quarantine officer at said station that the vessel, cargo, and passengers are each and all

free from infectious disease, or danger of conveying the same, said vessel shall be permitted to enter and admitted to entry at any port of the United States named within the certificate. But at any ports where sufficient quarantine provision has been made by State or local authorities, the Secretary of the Treasury may direct vessels bound for said ports to undergo quarantine at said State or local station."

That section eight of said act shall be amended to read as follows:

"That whenever the proper authorities of a State shall surrender to the United States the use of the buildings, grounds, and disinfecting apparatus at a State or municipal quarantine station, the Secretary of the Treasury shall be authorized to purchase them at a reasonable compensation, or pay a reasonable rental for their use, if in his opinion they are necessary to the United States; and the expense of said purchase or rental is made payable from the epidemic fund.

"That the Surgeon-General of the Marine Hospital Service shall, whenever he may deem it necessary, appoint in each port exposed to yellow fever, or where such disease has even been introduced, a port sanitary inspector, who shall have been a practicing physician for at least five years before his appointment at said port, and who shall be familiar with the symptoms of the disease hereinbefore mentioned, and skilled in its prevention and treatment.

"It shall be the duty of the port sanitary inspectors or quarantine physicians so appointed to make careful examination of the sanitary condition and surroundings of the ports where they reside and for which they are appointed, and to report each month, or oftener, if required so to do, the facts as to the sanitary condition of such ports to the Surgeon-General of the Marine Hospital Service, with such suggestions and recommendations as they may think necessary and proper. The said port sanitary inspectors shall perform such other duties in treating yellow fever or other infectious diseases as the Surgeon-General of the Marine Hospital Service shall direct; and they shall each be paid from the Treasury, upon vouchers signed by the Surgeon-General of the Marine Hospital Service, the sum of fifteen hundred dollars annually, payable, in equal quarterly installments, on the first days of January, April, July, and November."

SEWERS AND HEALTH.

From "Commercial-Appeal," Memphis, Tenn., July 30, 1899.

That sewers give new life to a community, situated like Memphis, is shown by the Board of Health reports upon certain diseases that owe their origin and spread to unsanitary conditions.

The Board of Health last year kept tab on its health reports and located the principal diseases to the districts and wards from which they were reported.

There were only two districts, so far as Dr. Jones, the health officer, was concerned. The sewered district offered one, and the unsewered district offered the other. Whenever a case of scarlet fever, diphtheria or typhoid was reported, it was duly recorded, and if it was in the sewered district it was so stated, and if in the unsewered district it was so recorded.

The result is startling.

It offers a percentage that will astonish even those who have most strongly advocated the sewer system.

There was a difference in population to be considered, too, and the sewer and sanitary census shows that in the sewered district the population was five times that of the population in the unsewered district. This is a fact to be borne most prominently in mind in considering the result, that the sewered district outnumbered the unsewered district five to one, offering 80 per cent. more population in which sickness might spread, and yet the following results are shown:

In the sewered district, with its great population, there were reported, in 1898, twenty-eight cases of diphtheria, while in the unsewered district, with only 20 per cent. of the population, there were thirty-eight cases, showing an increased difference of ten cases.

In the unsewered district, with its small population, there were reported during the year forty cases of scarlet fever, while in the sewered district, with five times the population, there were only twenty-four cases, very nearly a 50 per cent. reduction, with every reason, in point of numbers, why the percentage should have been reversed.

There were twenty-three deaths from typhoid fever, thirteen of the fatalities occurring in the place they were first reported from in the unsewered district. Six cases were reported from the

sewered district and four cases died in the city hospital, having been carried there from the annexed territory, showing really that seventeen of the fatalities from typhoid occurred in the unsewered district and only six in the sewered district.

This is a showing which will attract the attention of health departments of other cities, and has caused the commissioner of public health at Washington to direct his eyes this way.

That in the part of the city unsewered there should be seventeen deaths from typhoid, while in the sewered part of the city, with five times the population, there should only be six, is the strongest recommendation that can be made in behalf of the sewer system.

The report on cases of malaria was not kept up, but the physicians of the city can judge best where they visited the most cases. Dr. Jones says that the record, had it been kept, would have offered still more convincing proof of the efficiency of the sewer system in promoting good health. Next year the opportunity for judging this will be still greater, because by Christmas twenty-five miles of additional sewerage will be completed.

In this connection, Dr. Jones makes an important official statement, and one of the most important given out by his department since the work began. He says:

"By August 15 every house, building or residence in the old city of Memphis, with the exception of eleven houses west of Walnut street, at Central Point, will be connected with sewers."

Sanitary officers are now serving notices on all property owners, and by Saturday night all sub-mains, laterals and small connections in the old city will be complete and property owners can then connect without delay. With the old city sewered by Saturday next, and house connections made by August 15, the good that has been so long anticipated will have been accomplished. There is one section which can not be reached before October, and that is Central Point. This will have to drain, because of its situation, into the Sophia bayou main, which is just being put under way. The old city mains can not be used to reach it. This will occasion the delay. There are in this particular point and on the city side of the old city limits eleven small houses, and with this exception the old city may be said to have reached a condition of immunity from diseases owing their existence to unsanitary environments.

A glance at the figures and a few minutes' calculation shows how great a difference there is in the ratio of sickness in the

sewered and unsewered districts; and admitting that these two sections of the city contained the same population, the amount of typhoid fatalities lacks only three in the unsewered section of being double that in the sewered city.

This may be carried out still further, but it is not necessary; the very marked difference in favor of sewers is stronger than anything which might be written and is the strongest argument that can be offered in behalf of the work which Mayor Williams is pushing.

These facts are correctly arrived at because the Board of Health was anxious to ascertain what was the direct benefit to be derived from sewers, and the result has been more than satisfactory. According to the city directory, the population of the sewered district was more than five times that of the unsewered district, but it is from the sanitary reports that these facts are taken, and these reports compute the population to be about five to one. The showing also related to smallpox, but so much of this disease was imported that the department found it impossible to locate all of the residents, and sometimes a case brought up the river would circulate in a settlement, and the usefulness of sewers could not be shown, but in diphtheria and typhoid and scarlet fever and malaria the advantage of proper sewerage could be readily shown.

Dr. Jones says he is going to show next year, when the sewerage system of Greater Memphis is nearly completed, other facts of interest, and he expects to see a decrease in the death rate of 33 1-3 per cent., or very nearly that, and will compare the death rate of 1900 with years in the past. There has already been a decrease, but it is not so great as this. With the figures given the man who differs with Dr. Jones and his policy of making all property owners connect with the sewers will find some very substantial food upon which to reflect, and it is proof incontrovertible that with every mile of sewer pipe laid the death rate is being decreased and the amount of sickness lessened.

These facts further show what a great work is in progress and how important it is that the annexed residents should be given the earliest relief possible.

Mayor Williams says he appreciates the importance of good bridges and streets, but at present he thinks that sewers are of the most vital consideration, and with the health of the annexed territory insured, he will then look to their physical comfort, but at present his administration is being operated in sympathy with the Board of Health.

MORE LEAD POISONING FROM WATER PIPES.

THIRTY CASES REPORTED.

Milford, Mass., July 13, 1899.

The Board of Health has received an official communication from the State Board of Health, which very plainly states that the present use of lead pipes in serving water to the consumers is such "that the health of a large number of people in the towns of Milford and Hopedale is being endangered by the use of water for drinking and for cooking which is drawn through lead pipes."

The State Board says that this judgment is arrived at from actual analysis of copious samples of water taken frequently. The document which is given below certainly raises not only a grave question as to Milford's health, but, in the present financial condition of many Milford residents, an equally grave question as to the enormous expense surely entailed on them by a wholesale change of lead pipes for not even wrought iron service pipes, but for "tin-lined" or tin pipes.

It is a perfectly fair question to raise in this connection as to the combined comparative death rate of Milford and Hopedale with that of other towns and cities in the States. It is unquestionably true that the citizens of Milford and Hopedale are as yet unconvinced that there is just ground for general fear of lead poisoning.

It is probably quite true that lead traces may have been found by analysis in Milford drinking water, but it is also true that alcohol is developed as a process of bread baking, and yet no Milford person has yet been sent to the dipsomaniac hospital for undue use of such alcohol. The State Board is not to be censured for its notification to the Milford Board of Health, but its conclusions are so at variance with generally received local opinion that it is to be hoped some of the premises of the State Board do not justify so wide a generalization.

The formal letter says:

"Gentlemen: In a communication to your board in 1897, the State Board of Health called attention to the danger of the use for drinking of the water of your public water supply drawn through lead pipes, and this board has recently made further investigations in the town of Milford with reference to the action of the water

of the public water supply upon the service pipes through which the water is supplied to consumers, most of which, it appears, are lead.

"In the course of these investigations many samples of water have been collected from lead service pipes in various parts of the town, and the results of the analysis have shown the presence of lead in all cases where the water has been drawn through pipes of that metal, and in many cases the quantity of lead has been found to be dangerously large.

"In connection with this investigation, information has been collected from about half the physicians of the city, who report about 30 cases of lead poisoning in the towns of Milford and Hopedale, some of which are of very serious character. Wherever practicable, samples of drinking water supplied from house faucets in the houses of persons suffering from lead poisoning have been collected and analyzed, and the results in all cases have shown the presence of lead, generally in large quantities.

"The ground waters in the State which take lead from pipes, are found to contain an excess of carbonic acid, and the water of the Milford water supply has been found to contain an amount of carbonic acid that is only exceeded in the water supplies of three places in the State, which have been investigated in reference to their action on lead pipe. The investigations made by the board are not complete, but they have been carried far enough to show definitely that the health of a large number of the people of Milford and Hopedale is being endangered by the use of water for drinking and cooking which is drawn through lead pipes.

"By boiling the water the lead is not drawn off, but may be concentrated, so that the use of boiled water in making tea, coffee, etc., and in cooking, may result in as serious injury as the use of the water directly for drinking. If the water is allowed to run freely before using, the quantity of lead taken up will be less than when the water is allowed to stand in the pipe for a considerable time; but even when allowed to run freely, it may contain a sufficiently large quantity of lead to produce serious injury, and the only way in which safety can be insured is by removing all lead pipe which conveys water used for drinking or for cooking, and replacing it with a pipe which will not be attacked by the water, or if attacked, will not be liable to injure the health of those using the water.

"It has been found in the course of these investigations that water which attacks lead pipe will also take up the zinc from a gal-

vanized iron pipe, so that the coating is not likely to protect the galvanized iron pipe for any considerable length of time. The indications are that if pipes of plain wrought iron should be laid, while no injury would be done to the health of the people using the water, large quantities of the iron might be dissolved from the pipes, rendering the water unsatisfactory. Pipes made of tin, or lead-lined, with a considerable thickness of tin, could be used with safety for service pipes, and pipes of iron lined with cement, where the work was thoroughly done, would also be satisfactory.

"By order of the Board,

"SAMUEL W. ABBOTT, Secretary."

At a special meeting of the Water Board of Lowell, July 31, with reference to the communication from the State Board of Health, of June 29 (as published in our August issue), a communication from the Middlesex North Medical Society asking for a thorough investigation of the water pipes and the matter of lead poisoning was read by President Weaver, of the Water Board. It was referred to the Committee of Conference with the Board of Health.

Various views were expressed as to what data the State Board of Health might have based its analysis on. President Weaver remarked that there was a singular circumstance to be noted in view of the positive communication of the State Board. He said that the plumbers, if anybody, would be a class of men who would be most likely to be interested in a wholesale change of piping. But he had talked with a large number of the plumbers of the city, including some of the leading houses, and he had not as yet found any of them but what laughed at the idea of lead poisoning through the water pipes. Still it was the opinion of all the member, including the president, that something must be done.

The discussion then turned into the matter of employing chemists, and there was some variation of opinion as to whether men high in that profession or those of an ordinary character should be employed. It was agreed that it would not require a remarkably expert chemist to analyze water, but the question came upon employing men of reputation whose testimony would be convincing to the community.

The name of Prof. Atwood was mentioned, and Supt. Thomas cited one or two well known chemists. President Weaver was willing to leave the matter to the superintendent's judgment, but Mr. Fels made a motion that the president and superintendent

ascertain the names of suitable chemists, the cost of analysis, etc., and submit the same to the board. This motion was carried.

In the further discussion which followed, President Weaver said that while he personally took no stock in the matter of lead poisoning, as president of the board he felt that action should be taken as soon as possible. He was besieged by inquirers every day, and could not afford to give time to be stopped in that way from his business. He wanted to see some action projected and the matter placed in the proper hands for analysis of one man, whether in behalf of the State Board of Health or any other body. He believed in having an independent analysis by the Water Board, and did not care if the local Board of Health had one also. Then all could be compared, and if the final result made the showing claimed by the State Board he should give his official vote to any action in the way of remedy, no matter what the expense, even if it included the entire change of the water system. But he did not expect to find any such result.

During informal discussion prior to adjournment regarding the matter of lead poisoning, it was alleged that sundry local doctors, some of whom had been members of the Board of Health; Engineer Mills, who built the Lawrence filter, and the State Board of Health had always been opposed to the driven well system and argued in favor of filtered river water. It was asserted that this claim of lead poisoning was part.

President Weaver said that more spring water was being sold in Lawrence to-day than there ever was in Lowell, in spite of the Lawrence filter.

All of the members of the board were agreed on the purity of the driven well water, which had been proved by repeated analysis. But all also agreed that no matter of expense should stand in the way of a satisfactory solution of the claim of lead poisoning, and it was apparent that none of the commissioners would allow their personal view to interfere with their official obligation. Messrs. Weaver and Fels declared their intention of having analysis of the water at their residences for their personal satisfaction.

Members of the board were still of the opinion that the State Board of Health analysis, in order to show what it claimed, should be based on samples taken from all parts of the city and not from some particular locality.

EFFECTIVENESS OF ANTITOXIN IN THE TREATMENT OF DIPHTHERIA.

Dr. J. J. KINYOUN, U. S. Marine Hospital Service, in charge of the Bacteriological Laboratory at Washington, in an article published in the "Forum" for August, gives a lucid historical sketch of the progress and efficacy of the antitoxin treatment of diphtheria. The treatment began to be used in the Berlin hospitals in 1894, and the first full year of the antitoxin period was 1895. The following is the hospital record at Berlin for the years specified in cases of diphtheria and membraneous croup, which latter disease has been found to be generally due to the diphtheria bacillus, and which consequently yields as readily to the anti-toxic treatment as diphtheria: 1892, 3,683 cases with 1,342 deaths; 1893, 4,315 cases with 1,637 deaths; 1894, 5,220 cases with 1,416 deaths; 1895, 6,106 cases with 987 deaths; 1896, 4,345 cases with 559 deaths; 1897, 3,723 cases with 546 deaths. The antitoxin was used for three months only in two of the hospitals in 1894, and the death rate fell from 37.7 per cent. in 1893 to 27.1 per cent. In 1897 the death rate had fallen to 14.6 per cent.

In the Kaiserin Friedrich hospital, in 1894, the new treatment was used from March to September, and the mortality in all cases of diphtheria and croup was 15.6 per cent. From September to November no further supply of the serum could be obtained, and in that period the mortality rose to 48.8 per cent. Then a supply of serum came to hand, and on a resumption of the new treatment the mortality rate at once fell to the former percentage. This was a demonstration of its effectiveness which could not be explained away.

The Paris statistics do not give the whole number of cases treated, and we must judge from the number of reported deaths from the two diseases in question. From 1886 to 1893 the number of deaths averaged about 1,500 a year. In 1895, the first year in which antitoxin was generally used, the number fell to 993; in the next year to 411; in 1897 to 444, and in 1898 to 274. The record of the London hospitals is not equal to that of Berlin and Paris, but there, too, the death rate has been greatly reduced. In New York during 1894 some 2,900 deaths from the two diseases were reported; in 1898, under the new treatment, the number was only

900. In Boston the death rate from these causes averaged nearly 31 per cent. from 1880 to 1894; from 1894 to 1897 it was only 12.6 per cent. In Chicago the rate prior to 1895 had been over 30 per cent.; since then it has fallen below 10 per cent.

Prior to the introduction of the antitoxin treatment recovery from croup was rare, unless effected by tracheotomy or intubation. Reports upon 5,546 cases before 1892 showed a death rate of nearly 70 per cent. Another investigator collected reports of 12,736 cases occurring prior to 1887, where the death rate was 73. Now all this is changed, and out of 1,074 cases reported to the American Society of Pediatrics only 668 required surgical treatment, and the percentage of recovery for all was nearly 79 per cent., as contrasted with a former death rate of 70 per cent. Tracheotomy is now giving way to the milder operation of intubation, and even this is becoming less and less necessary owing to the prompt application of the new remedy. It has been stated by Dr. Behring that if this remedy could be applied on the first day of the disease there would be practically no mortality from diphtheria, and Dr. Kinyoun fully concurs in this.

The question at once arises here why antitoxin may not be administered to persons exposed to a diphtheria or croup epidemic as an immunizing agent, as vaccine virus is used against possible exposure to smallpox. While the two diseases differ materially in the nature of their origin, there is good reason for believing that preventive treatment may be as successfully pursued in the one case as the other. So far as tried, it has met the most sanguine expectations. It is mentioned in the "Forum" article that a Dr. Briggs has collected reports of 20,000 cases of exposure to diphtheria which have been treated with immunizing doses of antitoxin, and only one fatal case was known to occur, while only 109 cases of the disease in a very mild form developed. It may soon be that "antitoxication" will be made as prevalent among children and others as vaccination.

TWINS BORN IN DIFFERENT YEARS.—The Deutsche Medizinal-Zeitung for March 28 cites from the Progrés Médical the case of a Jersey woman who gave birth to a daughter at ten o'clock in the evening of December 31, 1897, and to another one about two o'clock in the morning of January 1, 1898. The one born last was better developed than the first one.

MEDICAL EXCERPT.

By T. P. Corbally, A. M., M. D.

Alcohol and Cyclism.—MM. L. Jacquet and Regnault ("Le Progrès Médical," 29th July) believe that the prevailing popular belief that alcohol gives strength to the system is one of the causes of the prevalence of the increasing use of alcohol throughout the country. It is therefore the duty of physicians to combat this error, which they have heretofore contributed largely to spread among the people. We have had, they say, occasion to enquire of some well-known cyclists their opinion of the effects of alcohol from a professional point of view. Those consulted, Mr. Miller, of Chicago; Calmettes and Goring, of Paris; Monachon, of Geneva; Fischer, of Mulhouse. Their reply was invariably the same; they are all absolutely temperate, even when not engaged in active exercise they avoid aperitives and absinthe. As to their opinion of it during the race proper, it may be resumed in a single curt and emphatic formula: Alcohol weakens the limbs: "L'alcohol coupe les jambes."

In the spring of 1888, during the severe snow-storm popularly known as the blizzard, the trains on the Long Island railroads were stopped and the passengers to New York were obliged to endure cold and hunger, or walk several miles through the snow-drifts. A young man, tall, slender, rather delicate, made one of the party who sought relief. When refreshment was found he absolutely refused alcoholic drinks in any form and took a full cup of moderately strong coffee instead. Having found a place in which rest could be obtained, the most delicate of the party was the least exhausted after the prolonged and severe journey. Relying on his own experience he has since, much to his advantage, avoided alcohol and tobacco.

How many of the numerous accidents that are occurring daily are due to overstimulation? Investigation is due to the public.

Paralytic Club-Foot.—M. Richelot presented to the Académie de Médecine a report on the investigations of MM. Péraire and Mally on the treatment of certain forms of paralytic club-foot. The treatment consists in causing the healthy muscles of the leg.

in cases of partial paralysis, to take the place of the paralyzed. ("Gazette Hebdomadaire, 2d July.)

The muscles of the external group may be engrafted into the muscles of the anterior or posterior group. This method, which is quite ingenious and gives good results, is not so new as MM. Péraire and Mally suppose: our distinguished colleague, Professor Piéchaud, and Professor Bergonie, have successfully treated a number of cases of inter-muscular and inter-tendinous grafting, in which the muscles that remained healthy, after cases of infantile paralysis, were made to aid the movements of the diseased muscles and to prevent probable inevitable deformity.

If the deformity is great the re-establishment of the muscular action by grafting, will not, in all cases, bring back the limb to its normal form.

According to MM. Péraire and Mally, the two indications in this operation should be: 1st, not to attempt to supply the place of muscles that are entirely degenerate; 2d, not to perform anastomosis, unless a certain number of the muscles remain healthy. The anastomosis would then be justified only in cases of paralysis that may be both incurable and incomplete.

An incision, they say, should be made over the tendon of the paralyzed muscle. This tendon is divided so as to form a sort of flap conveniently located; then this flap is sutured to a similar flap dissected from the tendon of a healthy muscle in the neighborhood, whose functions must correspond with those of the atrophied muscle. Then the foot is put up, firmly bandaged, and immovable, for fifteen days; at the end of this time the child may begin to walk.

The anterior tibial and the peronei may be supplied by the triceps, and vice-versa, the triceps may be supplied by the deep muscles of the leg and the peronei. Paralysis of the anterior tibial is easily corrected by an anastomosis with the extensor proprius of the great toe.

This operation enables the surgeon to very materially correct certain functional action of paralyzed muscles. It is the special operation for paralytic club-foot with definite but limited defects. It is much preferable to osteotomy and enables the surgeon to avoid, in the great majority of cases, extensive resection of the skeleton of the foot.

TYPHOID FEVER IN PARIS.—M. Netter has made very careful enquiry into the questions of the recrudescence of typhoid fever

during this year, and has found that there is no doubt of the increase; the fact is proved by the statistics;—report to the Société des Hôpitaux in "Le Progrès Médical," the 29th July last. This increase began, according to M. Netter, in August, 1898. In his enquiry into the cause of this increase in the death rate, he has found that the inhabitants who were obliged to drink the water of the Vanne suffered most. M. Netter thinks that the overturning of the sub-soil in Paris has caused the infection of the water sources, and given rise to a sort of epidemic. One reason for accepting this hypothesis is the diminution of typhoid fever in the precinct of Paris, while it has greatly increased, even during the month of July, in the city proper.

M. Lancereaux has shown that the epidemics of 1882, and of 1876, that spread so rapidly, were due to the substitution of the waters of the Seine and the Marne for the water from the springs.

THE SIGNS AND TESTS OF DEATH.—(1) Cessation of respiration—(*a*) Mirror test; (*b*) feather test; (*c*) water or mercury test; (*d*) stethoscopic test; (*e*) rhythmic traction of the tongue. (2) Cessation of circulation—(*a*) Stethoscopic test; (*b*) ligature test; (*c*) scarification and cupping; (*d*) opening of an artery; (*e*) needle test (Cloquet's); (*f*) fluorescine test; (*g*) injection of ammonia (Monte Verde's test); (*h*) diaphanous test (Carriere's); (*i*) Roentgen ray. (3) Changes in the eye—(*a*) Test by bright light; (*b*) test by mydriatics; (*c*) test by ophthalmoscope; (*d*) test by ophthalmatonometer. (4) Loss of animal heat —Temperature test. (5) Loss of sensation and of motion—(*a*) Electric test; (*b*) heat test; (*c*) caustic test. (6) Muscular flaccidity and contractility. (7) Cadaveric ecchymoses, lividity, or hypostases. (8) Cadaveric rigidity, cadaveric spasm, rigor mortis. (9) Putrefaction.—J. HEROLD.—"Medical Record."

MEAT AND CANCER ("Practitioner").—Verneuil, some years ago, said that he and other hospital surgeons in Paris had been struck by the much greater number of cases of cancer of the tongue and other visible parts that came before them than had been the case thirty or forty years before. He attributed the fact to the increasingly carnivorous habits of the population. The vegetarians naturally hailed this suggestion with enthusiasm, till it was pointed out that cancer is just as prevalent among the mild Hindus, to whom the flesh-pot is an abomination, as among the "cow-eaters" whom they despise. Among ourselves there seems

to be a widespread popular belief that the pleasant and harmless if not exactly necessary tomato has something to do with the production of cancer. Whenever the question of cancer is touched upon in the lay press, this tomato theory is sure to be brought forward with a gravity worthy of a better cause.

MOSQUITOES AND MALARIA.—The Italian observers, Grassi, Bastianelli, and Bignami, who are associated in carrying out a series of investigations at the hospital of Santo Spirito, with the object of throwing light upon the etiology of malarial fever, have again met with success in their inoculation experiments with mosquitoes. On this occasion only one species of these insects was employed in the experiment, namely, Anopheles claviger, captured as before in the adult stage in the malarious region about Maccarese. The subject of the experiment was a young man who had never suffered from malarial fever, and who was received into the hospital of Santo Spirito for hysteria about four years ago, during which time he has been constantly under observation and has had no kind of fever whatever. This man for nineteen days slept in a room in which were set at liberty from time to time numerous specimens of Anopheles claviger. On December 2d (eighteenth day) he began to feel unwell, and on December 3d the blood, on examination, was found to contain the parasites of malarial fever, exclusively of the common tertiary type (the spring tertian of Italian writers). This form of fever is prevalent at Maccarese. Considerable difficulty is experienced in continuing these experiments on account of many of the mosquitoes dying and others refusing to feed. This is probably due to the lateness of the season. —"Scientific American" Supplement.

INCENDIARY MICROBES.—The cause of the so-called spontaneous outbreaks of fire in stacks remained for ages a sealed mystery. It has remained for the bacteriologist to unravel the cause of these conflagrations. M. Jean de Leverdo, in an article on the subject in "La Nature," recalls the fact that such combustions, as is well known to farmers, occur most frequently in stacks of insufficiently dried materials. In the presence of moisture the bacteria present in the fodder grow with marvelous rapidity. This growth is accompanied by the generation of heat. At the same time fermentation processes are set up, which transform the material into carbonaceous matter, porous and very light. But the

chemical processes are also attended by the liberation of heat, consequently a temperature may be reached which has been estimated at 300°. Owing to the insufficiency of oxygen in the middle of a stack the material consumes without flame, but should a sudden access of oxygen be permitted, oxidation proceeds with greatly accelerated rapidity, the temperature rapidly increases, and the supply of oxygen being sufficient, the whole superheated, highly-combustible mass suddenly bursts into flame. M. de Leverdo states that in order to guard against such a result, M. Benesch, an Austrian agriculturist, has invented a long iron prong, with which small quantities of the material in the centre of the stack can be brought to the surface and then examined, and at the same time the temperature of the interior be roughly estimated by touching the prong after leaving it in the centre of the mass for ten minutes.

To Remove Ear Wax.—Ricci has recommended that a few drops of hydrogen peroxide be introduced into the outer ear and preferably dropped directly upon the wax which is the source of trouble. After allowing this to remain in contact with the wax for a short time the ear should be washed out with warm water.

Poisoning from Artichokes.—M. Roger has reported to the Société de Biologie a small epidemic of gastro-enteritis which occurred in his practice recently, which he was able to trace directly to the ingestion, by those attacked, of preserved or canned artichokes. Examining the contents of one of the boxes, the vegetable was found to be of a handsome, almost natural green color, which at first gave him the idea that he had to deal with the effects of a copper salt. Chemical analysis, however, revealed not a trace of that metal. He then submitted the material to an examination by bacteriological methods, and was able to isolate a coli-bacillus and a micrococcus. The latter, on pure cultivation, was found to have the property, when cultivated on slices of artichoke, of communicating to the latter an intense green color. The micrococcus is pathogenic to the rabbit.

For Relief of Pain, in peritonitis or other acute inflammatory affections, Dr. Ellingwood, in his text book "Materia Medica and Therapeutics," recommends antikamnia, which, he says, as a pain reliever is certainly next to morphine, and no untoward results have obtained from its use, even when given in repeated doses of ten grains (two five-grain tablets). It is especially valuable during the progress of inflammation, and given in pleuritis or peritonitis

it abates the inflammatory condition, relieves the pain at once and the diffused soreness shortly, as satisfactorily as opium. It does not derange the stomach or lock up the secretions. It is also of value in pain of a non-inflammatory character, and is a convenient and satisfactory remedy in headaches without regard to cause, if the cerebral circulation be full.

BLOOD SERUM TREATMENT OF YELLOW FEVER.—Dr. P. E. Archinard, Bacteriologist to Louisiana State Board of Health ("New Orleans Medical Journal" for August), having his attention attracted to the published reports of his blood serum treatment of a case of yellow fever at the New York Quarantine Hospital, as noticed in our August issue, relates in detail a series of fourteen experiments with Sanarelli's anti-amarylic serum, which he performed at the Charity Hospital, New Orleans, and elsewhere, in 1898. He relates the cases in detail and concludes:

"From the above cases, which limit our experience with the anti-amarylic serum of Sanarelli as a curative agent in the human being attacked with yellow fever, we are forced to conclude that this agent, in our hands, has shown no curative powers whatsoever. None of the important and dangerous symptoms of the disease having been in any way mitigated or prevented, by its administration. Our hospital cases, it is true, were severe cases, and in some of them treatment was begun at so late a date as to preclude all hope. However, we have had cases enough, we believe, and the patient's symptoms before and after serum injection have shown so little change as to warrant our conclusion, as expressed above. In justice to Dr. Sanarelli, it must be said that he has never pronounced himself as believing absolutely that his serum was curative in the graver cases; he cautions all users of same, that the whole subject is still under study and recommends that this serum be used early. This latter instruction is not always easy to follow, as a diagnosis cannot always be made early. Indeed, in early cases of yellow fever, it is difficult to say which are going to be severe and which not, and, judging by an experience in this city in the last two years, the great majority of cases are benign and get well under any treatment, and necessarily serum employed at random in these cases would be at a great advantage.

"As regards the immunizing property of the serum in the human species, we have no experience and cannot speak with authority."

EDITOR'S TABLE.

SANITARIAN, SEPTEMBER, 1899.

☞All correspondence and exchanges, and all publications for review, should be addressed to the Editor, Dr. A. N. Bell, Brooklyn, N. Y.

YELLOW FEVER—"NO" DANGER IN NEW ORLEANS FROM THE UPTURNING OF POLLUTED SOIL.

New Orleans, August 9, 1899.

Dr. A. N. Bell, Editor SANITARIAN.

Dear Doctor:—I have read carefully the editorial in the August number of THE SANITARIAN on the subject of soil pollution, and, as far as I can judge, my views are in thorough accord with those expressed by you in this regard.

Our experience and investigations indicate soil pollution; but this pollution is greatest, with respect to pathogenic bacteria, nearest the surface and decreases with depth of soil. For this reason we hold that the removal of earth from below the surface is less harmful than the removal of filth from a gutter, and, as the greater danger must of necessity continue throughout the seasons, there is no reason for interrupting the lesser; and as the object of our public improvements in this respect is to do away with the filthy gutters, there is good reason to hasten their completion.

That works of a kind similar to those now in progress here are not conducive to ill health is, I believe, proven by the experience of other Southern cities.

In Fernandina, Fla., in 1877 and 1878, extensive works of this character were undertaken in summer without bad effect upon the health.

In Brunswick, Ga., in 1894, about twenty miles of sewer pipes were laid from May to September.

In Jacksonville, Fla., in 1894, streets were disturbed during the whole summer.

In Mobile, Ala., ninety miles of water mains and thirty-four miles of sewers have been constructed during the present summer.

In none of these instances were the health conditions affected unfavorably.

In Mobile the sickness was less than during the previous summer, although apprehension was felt in the beginning of the undertaking because, perhaps, of traditional fears.

I send a duplicate copy of the letter, mailed you too late for the August number. This, with the additional facts laid before you, constitute the justification for our belief, and, as the lawyers say, "We submit the case."

QUITMAN KOHNKE, M. D.,
Health Officer.

New Orleans, July 16, 1899.

Editor SANITARIAN.

Dear Sir: Under the heading "New Orleans and Yellow Fever" in the "Editor's Table" department of the July SANITARIAN, you refer to the action of the Board of Health of the City of New Orleans, in permitting excavations of soil during the summer months for necessary drainage work, and characterize it as a mistake, and to the opinion of myself on the subject as "remarkable," your own opinion is clearly opposed to that expressed by me in my report, as Chairman, to the Board of Health.

I have no reason to believe you are not a fair-minded man and an able sanitarian, and I ask you, therefore, to consider this question in the light of recently ascertained *facts* which seem, to my mind at least, and to the minds, I believe, of the medical profession of this city, to be opposed to a theory which, for many years, was held to be true as regards New Orleans—that the upheaval of soil caused yellow fever.

A wrong theory, advanced by the master minds of their time and held for a generation, clings with a persistency that disregards the weight of evidence for a time, but in the end it must release its hold and drop into the sea of error, filled with the conscientious mistakes of the most able men.

The master minds denied the floating possibilities of an iron ship—until it floated.

They ridiculed the idea of a steam engine being propelled by its own power—until it moved.

The theory of the telluric origin of yellow fever in New Orleans has been relegated, with other mistaken beliefs of the past, to the pages of history, and is no longer a live issue.

During a period of about ten years, extensive works of improvement, including excavations of considerable extent, have been in progress and have not been interrupted by the advent of warm weather.

House to house inspections have been made at various times

with the view of ascertaining the comparative health of the people dwelling in the vicinity of canals in course of construction.

No increased sickness was discoverable and no sickness was attributable to the carrying on of public works.

During the yellow fever of '97 and '98 it was noticeable that the fever did not select the neighborhoods through which excavations were being made; indeed, these parts of the city seemed to be singularly free from yellow fever.

Bacteriological examinations have been and are being made of the earth taken at depths of from one to twelve feet, and at the bottom of canals, as also from the surface and from the dirtiest of street gutters.

The results of these examinations show that bacteria are in greatest numbers on the surface, and decrease with depth of soil. The bacillus coli communis makes its appearance, in numerous colonies, in cultures from surface earth, and, diminishing progressively as the specimen is taken from a greater depth, disappears beyond a depth of four feet.

At points below four feet the indol test for the colon bacillus is negative, and bacteria in general are not usually found.

We are justified, by the result of experience and every scientific test that could be applied, in believing that excavations of soil in New Orleans need not cause or increase disease of any kind.

It is possible that this result is largely due to improved methods now in use and the strict observance of proper sanitary precautions.

Work of this kind is done rapidly, and excavated material is immediately removed from the thickly inhabited sections of the city. House drainage is looked after during the progress of the work, and an abundance of fresh water is employed to flush gutters and drains, stagnant water being not permitted to remain in the neighborhood of the newly dug canals, and the walls and bottom are finished in brick, cement and iron, and they are covered.

The masons follow very closely upon the heels of the excavators, and no portion of the canal is exposed to sunlight for a longer period than a few days. Electric lighting at night permits continuous and rapid progress, and every known mechanical aid is pressed into service. In short, it may be stated that canal "construction" in New Orleans to-day is, mechanically, a totally different proposition from canal "digging" forty years ago, and should be so considered sanitarily.

I can not agree that yellow fever ever *originated* in New Orleans or that it resides in our soil, to be exposed whenever conditions favorable to its development obtain.

The single case of fever occurring in this city during May, and reported as yellow fever, cannot be taken as an indication of anything whatever.

The sickness occurred in one of the oldest sections of the city, far removed from excavations of any kind, in a house which did not contain yellow fever in '97 or '98, and in a family that was not immune.

No yellow fever followed, in the persons of other members of the family similarly situated, and the possibility of a mistaken diagnosis is too great to make this case the basis of any assumption whatever.

I am sure you will give consideration to the matters contained in this letter, and I trust that you will agree with me that our experience, and the investigations carefully made with a sincere desire to learn the truth, do not indicate danger to health from excavation of our soil.

QUITMAN KOHNKE, M. D.,
Health Officer.

PER CONTRA.—Since the issue of August number we have received the following from the San Antonio "Express:"

State Health Officer Blunt, referring to the danger of excavations for street or other improvements in Southern cities in midsummer, says: "One of the worst epidemics any city ever had occurred in a Mississippi town several years ago just from that cause. They already had yellow fever, but began the work of excavating in summer for the laying of water mains. The opening of the earth let out all the yellow fever germs, and the result was that they never had such an epidemic. It taught them and the whole South a lesson.

"In the same year there was a violent epidemic of yellow fever at a little settlement in Hinds County, Mississippi, which was attributed to the upturning of the earth in the hot season and exposing a lot of filth to the sun in the digging of a big ditch. The fever germ got there in the same manner it reached many other points, but it developed more rapidly because of the favoring conditions.

"The yellow fever epidemic in Shreveport in 1873 was alleged to be largely due to the local conditions by which the atmosphere was

poisoned, and it is a somewhat remarkable fact that though communication was then open with nearly every other section of the country, crossroads quarantine being then practically unknown, there was no epidemic of the fever elsewhere in the South that year. There were sporadic cases in Vicksburg and elsewhere, but no epidemic. In 1867 the city of Memphis had an epidemic, breaking out in September, in the midst of the tearing up of the streets to put down a new wooden pavement in the place of the one that had rotted. There was perfectly free intercourse without quarantine restriction, but the fever did not spread to any other locality. For many years New Orleans was supposed to have yellow fever every summer, but it was not until the spread of the epidemic over so large an extent of territory in 1878 that the quarantine precaution was so generally adopted.

"There is still an impression among many of the old timers in the Eastern and Southern States that cleanliness is the best precaution against contagious or infectious disease, and that epidemics will not grow out of a few sporadic cases unless the conditions are made favorable by unsanitary conditions."

Quoting the best history of the conditions of yellow-fever outbreaks that has ever been written (La Roche on Yellow Fever, 1855)—written when physicians were much more personally conversant with the disease and the local conditions connected with it than they are now—"Every physician knows that the digging of canals, the opening of ditches, the cutting down of bluffs, the leveling up or digging down of streets, the opening of roads, etc., have proved highly injurious, not only in this country, but in parallel or hotter latitudes, as also during the hot season of cold regions. The results of operations of the kind in the East and West Indies are on record, and are of a nature not to be forgotten. Many an epidemic of bilious, intermittent and remittent fever, may be traced to occurrences of this kind, as the writings of Lancisi, Drake, Evans, Blane, Cassan, Maccullock, Usher Parsons, Auenbach, Davy, Gaultierde, Clanboy, Merrill, Grant, Stevens, Villermé, Burchardt, Barton and Caldwell will fully attest," and following the citation of these authorities, the author proceeds to specify the antecedent conditions of several outbreaks of yellow fever in Natchez, 1816-1839. Quotes Dr. Barton's description of New Orleans and Natchez antecedent to the terrible epidemic in 1853; Prof. Dickson's and Dr. Simons' descriptions of the public works going on in Charleston immediately precedent to the yel-

low fever epidemics there, in 1842 and '52, and Dr. Wragg's description of the "filling up of low grounds" going on when the epidemic of 1854 occurred. To the credit of Dr. Barton it is stated that two months before the outbreak of the great epidemic in New Orleans in 1853 he predicted it (based his prediction on the history of previous epidemics), in consequence of works then in progress, "the simultaneous construction of four railroads in and around the city; the digging of a new basin of vast extent in the rear of the city; the enlargement of the Canal Carondelet; the open sewers, scarcity of water, insufficient drainage, and the practice of spreading over the streets the horrible filth of the gutters, to fester and reek in the sun—if all these are continued during the hot months, with the proper meteorological condition, our exemption from a severe epidemic should almost seem miraculous. Here let it be remembered is an epidemic predicted on data of a positive kind, by an experienced and observant physician, and when that epidemic arrives, some are found disposed to attribute it to importation from abroad, and quarantine measures are suggested to guard against the further introduction of the disease!"

Well, it may be observed: all this is ancient history, to be "relegated, with other mistaken beliefs, to the past * * * and is no longer a live issue." Yet the writer hereof has lived long enough to have been a contemporary to some extent with some of the authorities cited, and, moreover, an observer of such conditions in various climates and localities, and infected ships, and their propagating properties, both before and since the now universally accepted "live issue"—a living germ as the essential cause nourished by such conditions, and just now, as it were, found to be viable, though dormant, under low temperature, but ever liable to restored activity by summer heat.

SANARELLI'S BACILLUS ICTEROIDES.

Dr. Novy (Medical News, Aug. 12, 1899), having satisfied himself that the bacillus icteroides was not destroyed by a freezing temperature for three days—10°C.—forthwith concluded that it could not be the cause of yellow fever, because epidemics of yellow fever are promptly brought to an end by a sharp frost. "In other words, the microbes of yellow fever are exceedingly sensitive to cold. This certainly cannot be said to be the case with the bacillus isolated by Sanarelli. * * * If, therefore, the Sanarelli bacillus were the cause of yellow fever, we would expect to find this

disease, like typhoid fever, distributed over the length and breadth of the American continent regardless of climatic conditions." To this contention, Sanarelli forcibly replies:

"Not only yellow fever, but all the epidemic diseases (malaria, etc.), and the epidemic diseases (cholera, pest, typhoid fever, dysentery and the like), diminish in violence and often almost disappear with the advance of the cold. But this phenomenon has absolutely no relation to resistance of their respective specific microbic causes to cold. The reason for their diminution during the winter is simply that while exposed to persistent low temperatures all pathogenic microbes without exception cease to multiply. But their cessation of reduplication by no means signifies that they have lost their vitality or virulence, since the return of warmer weather is almost invariably accompanied by renewed outbreaks of the epidemics. * * *

"Is it possible that Dr. Novy is not aware that during the old epidemics of yellow fever in Philadelphia and Baltimore, precisely during the months of November and December, while the temperature was at times below zero, more than 100 persons a week were being carried off by the disease? Or can it be that Dr. Novy does not know of examples of vessels infected with yellow fever, in which the germ of the disease was not destroyed despite the fact that they had been frozen up in Arctic ice for months? Or can Dr. Novy mention a single specific pathogenic germ that is not capable of enduring low temperatures?" From this point of view, at least, Sanarelli vindicates the hibernating conditions of yellow fever germs in polluted soil, as contended for by THE SANITARIAN.

YELLOW FEVER AT THE SOLDIERS' HOME, HAMPTON, VA.

This endemic, as it thus far obtains, is of questionable origin. The search for its cause reminds us of the remarks of Humboldt with reference to the frequent outbreaks of yellow fever at our Southern seaports, half a century ago: It is easier for and more comforting to the people to find that the fever is brought to them than it is to believe in its local origin; and it is never very difficult to find that somebody or some vessel from abroad arrived about or shortly before the outbreak.

The first case recognized in this instance was on July 29th. There were several then sick and had been for some time, but up

to this time there was no suspicion of yellow fever. Promptly on report of the first case to the Surgeon-General of the Marine Hospital Service, Dr. Wasdin, an experienced officer was dispatched to investigate it. He reported the next day in substance as follows:

"Early in July an old soldier entered the home for a short rest. Soon after he appeared at the dispensary for treatment, where he informed the physician in charge that he had recently returned from Santiago on a transport, and had landed in the United States at a northern port. He had set out for Manila, and had beat his way to Hampton on a freight train and entered the home with his baggage. He complained of dumb chills and fever, and was prescribed for. He mingled freely with members of the home, and disappeared a short time ago.

"From this as a possible cause the outbreak followed. Prior to Friday, July 21st, nothing of a suspicious nature was noted. The weekly death rate had been about as usual. On the nights of July 21st and 22d there became ill during the night with chills and fever eight or ten men, who had usually been in good health. These fevers occasioned no alarm until Thursday, July 27th, when a death occurred, the man becoming distinctively yellow some time prior to death. On or about the same date another died. He also turned quite yellow. Autopsies were held on both by a resident pathologist. It was then or a little later that the telegram was sent asking for an expert. I found there were 3,500 inmates and that 35 had been taken ill since the 21st."

The latest reports (August 10th) are to the effect that the disease is under complete control. Forty-two cases have occurred, with 11 deaths. Only one case has occurred since the 31st ultimo, that one so diagnosed on August 7th. This patient had been sick and under treatment for some days, and the case was not considered a new outbreak, but rather a delayed manifestation of the original infection. The soldiers in the Home have been removed to tents and the entire Home fumigated and disinfected. A most radical quarantine is enforced. The general health of the other inmates is excellent. House-to-house inspection of Hampton, Phœbus, Old Point Comfort and the small places on the road to Richmond is progressing and is about completed, but no new cases or suspects have been found.

From another source we learn that the cases occurring at the Home previous to July 27th were treated as dengue. Thus the ex-

perience of the epidemic of 1897 was repeated. The first one or two dozen persons who fell ill at Ocean Springs, Miss., in 1897, were treated for dengue, and it was not until several deaths occurred that it was admitted that the disease was yellow fever.

It will be difficult to show how the old soldier with dumb ague communicated yellow fever, unless some yellow-fever infected material was left by him. We await a report on the local conditions and what they have been all along with much interest.

DAMPNESS OF WALLS AND THE PRESERVATION OF MICROBES.

It is a matter of general interest ("Scientific American") to know how long disease germs will remain in a contagious condition in a house when the latter has not been thoroughly disinfected.

Some special investigations have been made on this point by M. Vito lo Bosco, a hygienist of Palermo, Italy, says "L'Illustration." The investigations were made of the walls of dwellings exclusively, as the floors are generally easily cleaned and disinfected.

The life of the pathogenic germs was found to vary greatly with the different materials of which the walls were constructed, and especially according to their degree of dampness or dryness.

As a general rule, walls covered with stucco or varnish were found least favorable for prolonging the life of the microbes, and walls which were normally dry possess to a considerable degree the power of self-cleansing. The typhoid bacillus, the cholera germ, the diplococcus of pneumonia, when placed on such walls, die after twenty-four hours at the maximum, and the diphtheria bacillus survives only seven days. The tuberculosis microbe only can remain alive for two or three months. On well-dried size, however, it survives even four or five months.

Damp walls, on the contrary, cause the vitality of bacilli to increase, and this to such a degree that the period of life of some under these conditions has not yet been determined. The microbe of typhoid fever, for instance, remains alive three days, that of diphtheria a month, and that of pneumonia from fifteen days to three weeks.

The knowledge of these facts should bring about useful practical applications.

The dampness of dwelling houses appears doubly dangerous, first, in itself, and second, because of the long life which it gives to the elements of contagion and infection.

Contrary to the traditions of the elegance of dwellings, which cause the walls to be covered with tapestry or paper in imitation of it, scientific experience would advise the employment of stucco or good varnish, which are best from a bactericidal point of view, both because they are easily washed and because they possess the property of cleansing themselves promptly and spontaneously of pathogenic germs which become lodged on them.

(Old houses and old ships that have been infected with yellow fever and not subsequently disinfected, remain infected and dangerous for an indefinite period.—Editor SANITARIAN.)

VEGETARIANISM AND RELIGIOUS ORDERS.

The "Medical Age" for June 25th says that it is publicly stated that there has been an important secession from the ranks of the vegetarians, the entire Dominican Order in England having received permission from Rome to eat flesh four days a week, instead of perpetually abstaining therefrom, as heretofore. In cases of ill health or of specially hard work, meat is to be allowed six days a week. This decision has been arrived at after the closest medical and official investigation of the effects of perpetual abstinence from meat in a variable climate like that of England, the result being that vegetarianism has been declared incompatible with physical strength and hard work.

STERILIZATION OF WATER WITH OZONE.

Marmier & Abraham (Compt. rend. 128, 1034) have made a trial of the use of ozone for the sterilization of drinking water on a large scale for the city of Lille. The results were completely satisfactory so far as the potability of the water is concerned, it having been proven that the only bacillus not destroyed was the bacillus subtilis, which is entirely harmless, and which, by the way, is not killed by a temperature of 110 degrees C.

TO DRIVE AWAY FLIES.

J. P. M. ("The American Druggist") says the castor oil plant has long borne the reputation in the South of driving away not only flies but winged insects generally. As it is quite an ornamental plant, it would be well to give it a trial by having several different pots of it about the house. Since the plant does not thrive except in the bright sunlight, it is advisable to have a supply of plants in duplicate, changing from the house to the open air,

and vice versa, say twice each week. A few of the leaves scattered about a room will also serve the desired purpose. It has been stated that flies will not go near sweet pea blossoms, and that a bunch of these blossoms on the soda counter will keep it clear of these pests. Fumigation with pastils by burning pastils of pyrethrum will also drive away flies, though the remedy is rather worse than the complaint. The Japanese lily (Lilium auratum) has recently been recommended ("Nat. Drug.") as being very efficient as a fly-banisher.

FERMENTATION WITHOUT LIVING CELLS.

As a result of the investigations ("Journal of Franklin Institute," August, 1899) of Professor Büchner, of Tübingen, another of the fetiches of old chemistry is destroyed, namely, that living cells are necessary to fermentation. Professor Büchner, according to "Science," grinds yeast with quartz sand in order to disrupt the cells, and submits the moist mass to a pressure of 500 atmospheres. The liquid contents of the cells are entirely removed and the cells totally disrupted. The filtered liquid is of a clear or slightly opalescent, yellowish color, retains the odor of yeast, contains considerable carbon dioxide and some albumen. Most interesting is the behavior of the yeast juice toward sugars, fermentation being set up much more quickly than by yeast, and proceeding much faster. The gas evolved is almost pure carbon dioxide. When carefully dried at a low temperature, the fermenting principle is not destroyed, and it is possible that, when desiccated, the activity of the ferments may be preserved indefinitely. W.

BROOMS AS GERM BREEDERS.

Bacteriologists devote themselves to the detection, isolation and destruction of bacteria, and, strange to say, says "The Scientific American," they do not appear to have given much attention to the danger that lurks in the ordinary articles of household use. For example, the common house broom is both the habitation and breeding place for whole colonies of bacteria, and cases of disease have been traced to this apparently inoffensive article. At Königsberg a course in bacteriology is given by a physician, in which he maintains that the strictest sanitary and hygienic conditions in things pertaining to the house should be inculcated, and in this country, in the Boston Cooking School, and doubtless elsewhere, there are many lectures given on bacteriology. The refrigerator

is one of the danger spots, for bacteriologists tell us that the minutest organisms may thrive even in melted ice, and putrefactive bacteria once gaining access to the household refrigerator will breed and contaminate butter, milk, meat, and other food kept therein. Cupboards and closets also afford an excellent breeding place for the ever-present microbe, and housekeepers will do well to look to such articles as refrigerators, brooms, dusters, etc.

THE WASTE PAPER NUISANCE.

Owing to the great cheapness of paper, caused by the ever-increasing use of wood pulp in its manufacture ("Scientific American"), and owing to the fact that it is practically valueless after having served its original purpose, it is the cause of a nuisance very prevalent in large cities. The paper is thrown into the streets or in lots, and is blown about with every gust of wind and collects under stoops and fence corners, where it is sometimes set afire by mischievous and thoughtless urchins. It is readily conceded that waste paper is dirty and untidy, and, according to "The New York Medical Journal," may, under some circumstances, act as a disseminator of disease. No effectual remedy for this has been devised, but that journal proposes to have ornamental iron urns swinging on trunnions, in which papers could be put and burned on the open-bottom grate. The object of having them swinging is to empty out stones and other incombustible matter. They might be put up in proper places and at convenient distances apart. As children like to play by making fires, it is likely that they will hunt for materials to gratify their inclinations in this respect.

The true solution of the waste paper problem is to pass stringent city ordinances, and see that they are enforced. In some cities it is an infraction of the sanitary code to throw papers in the street, and it is to be hoped that the regulations which exist will be enforced.

THE SCHOOL OF HEALTH OFFICERS,

Held at Burlington, Vt., July 10-14, under the auspices of the State Board of Health, appears to have been prospectively successful in its purpose—the promotion of education of local health officers in their chief duties, and the diffusion of information on the most needful subjects for the protection of the public health. The attendance was large, both on the part of health officers, of whom there were eighty present, and of the medical profession,

and the results can hardly fail to make themselves manifest throughout the State in the promotion of a more intelligent application of the sanitary regulations of the State Board of Health.

The chairman, Dr. C. S. Caverly, announced a recommendation from the State Board of Health, which he read, as follows:

"The State Board of Health has carefully considered the construction of the health laws of the State, including the registration laws, so called, with reference to burial, removal or cremation of dead bodies. The board recommends that all health officials and other persons shall construe the laws as permitting the burial of dead bodies of human beings in any town or city of the State, providing a certificate of permission for burial, removal or cremation shall have been issued by the health officer of the town or city where death occurred in accord with Sec. 6, No. 59, Laws of 1898; except in towns or cities having local ordinances controlling the burial of dead bodies, in which towns and cities parties wishing to bury dead bodies brought from other towns or cities will, of course, comply with such local ordinances. This recommendation is expected to be modified in cases of certain infectious diseases in accord with Sec. 4688, Revised Laws, and dead bodies will be transported in accordance with said section 4688 and section 4689, Revised Laws."

The following resolutions were adopted:

"Whereas, We, as a convention of health officers, believe that tuberculosis is communicated to the human family through butter, milk, cream and meat, therefore,

"Resolved, That it is the duty of the State to take such action in this matter as will cause the prevention, removal or destruction of all such sources of tuberculous infection."

"Whereas, Tuberculosis being a germ disease and contagious from one member of the family or community to another through the floating of the dried sputa in the air, and,

"Whereas, The common people are, as a rule, ignorant of the fact; therefore,

"Resolved, That it is the duty of the State Board of Health to circulate the necessary knowledge of the facts pertaining to the contagiousness of the disease either by lectures in all the large towns of the State, or by publishing and circulating literature upon the subject."

Then followed important papers and discussion. "Adulterations and Dangers of Milk," by C. H. Jones, of the Agricultural

Experiment Station at Burlington. He said, in part: "The adulterations are made by the introduction of water, the removal of a part of the cream, a combination of the two and the introduction of chemicals to conceal adulteration. A good legal standard and inspectors are of great aid to the honest milk dealer. The presence of the chemicals used in the adulteration of milk should not be tolerated for a moment. Milk when first taken from the cow is germ free. It soon becomes full of bacteria, and to them its changes are mainly due. As a rule, in country places where milk is quickly delivered the fluid is much more free from bacteria than where longer time is consumed in the process of delivery. Diseases are often traceable to milk supplies. The growth of bacteria may be checked by cooling and by certain chemicals not desirable. The best method for preserving milk is by Pasteurizing. This causes the milk to appear thinner than before. From a sanitary point of view, cleanliness should be insisted upon in all the surroundings of milk supplies."

The discussion of the paper was by Dr. C. S. Boynton, of Burlington. Dr. Boynton said there was much milk sold in Vermont not up to the standard, and there were not laws to regulate the evil. The existing law allows a man to have his herd inspected by State officials, but does not make it necessary that his neighbor's herd should undergo the same inspection. The utensils and clothing of the milkman need inspection, as do the milk itself and the herd which produces it. It is to you gentlemen that the people look for aid in doing away with adulterated milk. The subject was discussed by Dr. Don D. Grout, of Waterbury; Dr. W. S. Nay, of Jericho; Dr. O. W. Peck, of Winooski; Dr. J. H. Hamilton, of Richford, and Dr. C. S. Caverly, of Rutland.

The next paper was by H. L. Stillson, of Bennington, on the subject "How to Make Health Regulations a Success Among the People." The paper was divided under the three heads of equipment, sanitary education and environment. The knowledge and tact of a health officer should be inexhaustible. He should be a walking encyclopedia. The health officer's relations to the attending physician should be cordial. This is quite possible and leads to the query as to whether the health officer may not well be other than a physician. The officer should always be impartial. The community should be educated by the press, and the clergy is another class always ready to assist a health officer. School boards and teachers may be enlisted in the work by the officer. Environ-

ment brings up many new things for consideration. The statute should be made as light as is consistently possible. Nuisances should be carefully examined before they are ordered abated. No regulations will enforce themselves. The response to the call should be immediate.

Dr. E. M. Brown, of Sheldon, and Dr. H. R. Wilder, of Burlington, discussed the subject.

A letter and short paper from M. J. Hapgood, of Peru, Vt., on the subject of "Sanitary Country Inspection" was read. This was followed by a paper on "Water Supplies and the Significance of Constituents as Reported in the Chemical Analysis," by Dr. M. J. Wiltse, assistant at the State laboratory. The paper dealt with the process of securing samples and the analysis of water sent to the laboratory. It took up each of the matters reported upon when an examination is made, and told of the various surroundings tending to change the water in appearance at analysis.

Dr. J. H. Linsley, director of the State laboratory, read a paper on "The Significance of Constituents as Reported in the Bacterial Analysis." A complete examination of water is an investigation of its physical, chemical and biological properties. About 500 examinations will be made in the laboratory during this year. The value of an analysis lies in its interpretation, and in this all of its properties must be considered. Rain water is perhaps the purest water found in nature, although usually having organisms from the air. Surface water includes all water on the surface of the earth, and contains more organisms than ground water, and still water contains more organisms than running water. Muddy bottoms are responsible for a large number of the microscopic organisms. An important question is the relation of chemical analysis of water to its organisms. Experiments in this line are now being made. Much depends upon the despatch with which the water is sent to the laboratory. A few bacteria have always been found in snow. Some bacteria are not affected by a low temperature. Supplies of ice should be subject to analysis. Even hailstones contain bacteria. Rain has been shown to hold a variable number of bacteria. Experiments show that the water of rivers is purer as regards bacteria in summer than in winter. Very deep or driven wells contain few bacteria. The number in lakes varies, as does the distance from the shore at which the samples are taken.

The rate of bacterial increase is greater in pure than impure water. Various diseases have been found in water. The water

supplies of our towns and cities should be analyzed at least once a month yearly.

The paper was very interesting and highly instructive.

A brief discussion of the Widal test for typhoid fever followed, after which a few words from Chairman Caverly and a vote of thanks to the citizens of Burlington for their many hospitable acts closed the sessions.

MORTALITY AND MORBILITY REPORTS AND REVIEWS.

THE NATIONAL HEALTH SERVICE.

Annual report of the Supervising Surgeon-General of the Marine Hospital Service of the United States for the fiscal year 1898, being the twenty-seventh annual report of the Service and the one hundredth year of its existence.

A volume of eight hundred and fifty pages, with elaborate tables, diagrams and charts, describing the operations of the Service *per se*, the extension of its scope in co-operation with the army and naval forces during the war, and services rendered State and local boards of health in stamping out yellow fever and preventing the spread of smallpox: singularly illustrating the adaptability and efficiency of the service to the sanitary needs of the people under the varying conditions to which they are ever more or less liable.

As at present constituted, the commissioned corps of medical officers of the Service comprises 16 surgeons, 32 passed assistant surgeons, and 22 assistant surgeons; and temporary appointments under required conditions.

There are 22 marine hospitals and 11 U. S. quarantine stations, all equipped and in continuous use. And so, too, the Hygienic Laboratory at Washington, first opened five years ago, and since then equipped for general service and as a school of instruction for biological students. And besides those duties, officers have been detailed to attend and participate in the work of a dozen or more sanitary conventions, national and international, thus bringing to the Service the gist of sanitary progress, as displayed by practical men among the most enlightened nations and communities enlisted as votaries of preventive medicine.

The total number of patients treated by the Service during the year was 52,709, of which number 11,914 were in hospitals and the remainder, 40,795, treated as out-patients. Of these there are tabulated statistics in extenso. Three hundred and sixty-eight

pages are taken up by reports of fatal cases and autopsies; contributed articles on special diseases; statistics of the Pasteur Institute at Rio de Janeiro, and a report on the Vaccination Institute in that city for 1897; articles on yellow fever—its nature, diagnosis, treatment, and prophylaxis and quarantine regulations relating thereto; present status of the bacteriology of yellow fever; value of autopsic findings in cases that have died from suspected yellow fever.

"Public Health Service" comprises a brief account of cholera reported during the year 1898 at Hong Kong, Bombay, Calcutta, Madras, Singapore, and at ten places in Japan. A sketch of the yellow fever in the South during the fall of 1897 and in the summer of 1898 follows, with a diagram which purports to show its dissemination by persons in an evidently infected region—a worse than useless proceeding, because it diverts attention from the true source by which the disease is propagated. It is gratifying to observe, however, that in the search for causes and in the effort to stamp out the disease, in the several localities concerned, there was no friction between the State and local health officers and the officers of the Marine Hospital Service: all worked together in a common cause, and with such a prompt and happy result as to be eminently encouraging for future co-operation under similar conditions.

In a summary of yellow fever in other countries, it is noteworthy that the number of deaths reported from it in the cities of Cuba, for the calendar year 1897, was 6,034.

For Rio de Janeiro the number of deaths from it is summed up from 1850 to 1897, inclusive, 53,522; with but six years—1855, '56, '64, '65, '66, '67—exemption during the period. A table is presented which purports to show the numbers of yellow fever cases and deaths in foreign countries, November 1, 1897, to November 1, 1898—1,761 cases, 2,442 deaths: deaths only reported from several localities.

Following this summary is an "Investigation of the causes of yellow fever by the United States Marine Hospital Service," contributed to by several officers who have been in intimate contact with it in regions where it has commonly, as well as in those where it has only occasionally, prevailed; and, moreover, in communication and more or less co-operative work with those who have been chiefly engaged in biological researches. This investigation pretty well covers, rather rehearses, the researches of Sternberg, Sana-

telli, Archinard and Woodson, and others. It is an interesting sketch of a praiseworthy industry that is still barren of fruit. Next follows an account of the work done by the Service in aid of the State sanitary authorities for the suppression of smallpox. The report shows that during this year the disease was more or less prevalent in the District of Columbia and in 24 States, in 151 localities, and in some of these to an epidemic extent—notably in Alabama.

Summed up from November 1, 1897, to October 1, 1898, the number of cases reported was 2,642, with 27 deaths. This remarkably small mortality is attributed to the mildness of the disease where it prevailed most extensively, among the negroes in the Southern States, and its occasional occurrence in persons who were but partially protected by imperfect vaccination.

It is notable, with reference to the aid rendered the State sanitary authorities in this respect, that it was most needful and most depended upon in those States where the sanitary authorities have been the most pronounced in their wish to supersede the Marine Hospital Service.

Plague and leprosy have also received watchful attention. Statistics of their prevalence, in relation to their possible transportation hither, are presented; leprosy more particularly, because it is brought in closer relation by the acquisition of the Hawaiian Islands.

Abroad, sanitary inspectors were maintained for a portion of the year at Havana and Santiago, in Cuba; Kingston, Jamaica; Honolulu, Hawaii; on the Mexican border; and, throughout the year, at Yokohama, Japan, and at Rio, Brazil. Reports of services in these places are given in detail.

With reference to the extraordinary danger of yellow fever during the war, co-operation with the military and naval services was promptly provided for. Officers of the Marine Hospital Service were located in different cities along the South Atlantic and Gulf coasts for the purpose of maintaining vigilant watch with regard to the observance of quarantine regulations on the part of naval vessels and army transports, enjoined by the orders of the Treasury, Navy and War departments severally, and maintained, as detention camps were also, under supervision of the Marine Hospital Service, during the war. And so, too, at Montauk Point, there was co-operation and harmonious work under the direction of the Marine Hospital Service to prevent the introduction of yel-

low fever. Every vessel engaged in the transport service between the United States and Cuban or Porto Rican ports was required to carry a medical officer of the Army or of the Marine Hospital Service, whose duty it was to inspect the vessel and see that in a foreign port no material or person liable to convey yellow fever was taken on board; to keep the crews of the transports under surveillance, and on the return voyage to act as sanitary inspector. Before departure, ships homeward bound were made practically detention camps; and on arrival subject to detention for observation and disinfection.

Special reports of the several quarantine stations by the officers in charge follow. As also a summary of mortality statistics of 1,597 cities and towns in the United States for the year 1897.

Hygienic Laboratory report for the year, by P. A. Surgeon J. J. Kinyoun, Director, comprehends, besides continued investigations of pneumococcus and the production of a preventive and curative substance for the infections caused by it, progress in the effort to differentiate the true from the pseudo-diphtheria bacillus and investigation regarding etiology of variola, an elaborate report on the bacteriology of the Potomac water supply. Recognizing "the well-known fact that Washington has for many years enjoyed an unenviable notoriety in the number of cases of typhoid fever and diarrhœal diseases which annually occur," as verified by the District Medical Society and repeated examinations, 1894-'97, the subject was taken up by the Laboratory and the investigation assigned to P. A. Surgeon Sprague, whose report here appears, with a map of the Basin of the Potomac River, showing where water has been collected and bacteria of one kind or another have been found, the kind and number found at each examination and the percentage of times when colon bacilli were found. Diagrams and temperature charts of the progress of typhoid and typho-malarial fevers for a series of years accompany: demonstrating great particularity of research and results of the utmost importance to the health of the population of the District.

The report felicitously concludes as follows:

"The relations of the Marine Hospital Service with the State health authorities during the trying season which has just passed, as well as during the fall and summer of 1897, were without friction, but, on the contrary, were characterized by harmonious efforts against the common enemy. During the season just closed there was scarcely any friction, if any at all, even with local au-

thorities, but the previous year, in 1897, there was friction caused by unreasonable and arbitrary local quarantines, which, however, the State authorities themselves could not control, and which gave equal if not greater annoyance to them than to the Service.

"The above statement is pertinent in view of the loose assertions sometimes made, indicating undue antagonism between the State and national services. Thus in a recent medical journal the following criticism is made on the Service:

" 'Then there is the constant friction between the Marine Hospital Service and local boards of health, for, as a consequence of the yellow fever in the South, one State board of health has been compelled to resign.'

"The board of health referred to was the Louisiana board, with whose resignation in 1897 the Marine Hospital Service had no possible connection whatever.

"Letters expressing appreciation of the efforts of the Service have been received from the State health authorities of Louisiana, Tennessee, and Alabama."

Appended are the Congressional Committee investigations of and reports on the several bills recently introduced in Congress proposing modifications or reorganization of the national health service.

The latest phase of Congressional action in this regard, and that which now appears to have the right of way, is "House Bill 4363," printed in full on other pages—except figures referring to the other bills considered by the Committee on Interstate and Foreign Commerce, who reported it—which suggests the title: National Quarantine and State Auxiliary Sanitary Service.

It is adaptable to the declared purpose of the organization of State and Provincial boards of health, and deserves its support.

NEW YORK, 7,110,000. Total number of deaths reported by State Board bulletin for June, 9,443; annual death rate, 1,610; from zymotic diseases, 1,037.

City of New York, 3,550,053: Total deaths, 5,430; annual death rate, 18.64; from cerebro-spinal meningitis, 43; typhoid fever, 24; scarlatina, 61; measles, 71; erysipelas, 16; whooping-cough, 41; diphtheria, 178; diarrhœal diseases, 526; consumption, 577.

Borough of Manhattan, 1,953,569: Total deaths, 2,914; death rate, 18.14; from cerebro-spinal meningitis, 27; typhoid fever, 10; diphtheria, 88; phthisis, 317; percentage of deaths under 5 years of age, 41.4.

Borough of the Bronx, 163,537: Total deaths, 300; death rate, 22.3; from smallpox, 7; diphtheria, 11; phthisis, 78. Many large institutions raise the death rate.

Borough of Brooklyn, 1,231,548: Total deaths, 1,925; death rate, 19.75; from typhoid fever, 13; diphtheria, 71; phthisis, 162; diarrhœal diseases, 304; percentage of deaths under 5, 47.7.

Borough of Queens, 134,139: Ttotal deaths, 209; death rate, 18.96; from diphtheria, 6; phthisis, 15; percentage of deaths under 5, 38.7.

Borough of Richmond, 67,260: Total deaths, 82; death rate, 14.8; from diphtheria, 2; phthisis, 5; percentage of deaths under 5, 31.7.

Report for the First Quarter, 1899.—The number of births reported, 20,180; deaths, 16,718; annual death rate, 18.84. Of the Boroughs: Manhattan, deaths, 9,420, death rate, 19.29; Bronx 936, death rate 22.89 (mainly due to deaths in institutions of inmates transferred from Manhattan); Brooklyn 5,422, death rate 17.61; Queens 608, death rate 18.13; Richmond 331, death rate 19.68. Inspectors of the Sanitary Bureau made 451,781 inspections and reinspections, and returned 29,979 complaints. The division of food inspection reported a total of 268,521 inspections, and 1,402,773 pounds of milk, fruit and vegetables, meat and fish were condemned. Inspections made by the sanitary police numbered 88,048. There were reported 9,377 cases of contagious diseases; measles, diphtheria, and scarlet fever comprising about two-thirds of the total. The number of rooms fumigated or disinfected was 13,497; 15,262 pieces of goods were disinfected, and 1,330 destroyed. Antitoxin was administered in 171 diphtheria cases, in 110 of which a cure was obtained. In all 814 schools were inspected, the total number of visits being 28,892. The average of attendance of scholars was 389,304; of these, 41,043 were examined, the examinations resulting in the temporary or permanent exclusion of 2,536 children.

Albany, 100,000: Total deaths, 454; death rate, 18.72; from typhoid fever, 9; diphtheria, 1; phthisis, 21.

The "Times-Union" of Aug. 2 reports the filtering plant now sufficiently far advanced to be declared a success. Five of the filters have been finished and three remain to be. Superintendent Bailey said to-day that another would be to-morrow, and that there would then be a sufficient supply of the filtered water for the city. It will be a long time before the pure water will be drawn

daily in the homes of our citizens. The filters are new and have not been worked as hard as they might have been, with the result that the consumers are using the water faster than it was being pumped. When the sixth filter is completed there will be a sufficient supply.

Troy, 65,000: Total deaths, 121; death rate, 22.6; from typhoid fever, 2; phthisis, 23.

Utica, 55,000: Total deaths, 73; death rate, 16.11; from diphtheria, 4; phthisis, 7.

Syracuse, 120,000: Total deaths, 121; death rate, 12.26; from typhoid fever, 1; phthisis, 10.

Buffalo, 360,000: Total deaths, 305; death rate, 10.31; from typhoid fever, 5; diphtheria, 7; phthisis, 33.

Rochester, 175,000: Total deaths, 171; death rate, 11.88; from typhoid fever, 3; diphtheria, 5; phthisis, 18.

Yonkers, 42,000: Total deaths, 57; death rate, 16.51; from phthisis, 8.

Cohoes, 25,000: Total deaths, 44; death rate, 21.20; from phthisis, 7.

Kingston, 25,000: Total deaths, 29; death rate, 14.12.

Poughkeepsie, 25,000: Total deaths, 41; death rate, 20.0; from phthisis, 6.

Newburgh, 36,000: Total deaths, 27; death rate, 9.1; from phthisis, 3.

Schenectady, 28,791: Total deaths, 44; death rate, 18.60.

Binghamton, 45,000: Total deaths, 52; death rate, 14.0; from phthisis, 7.

Elmira, 40,000: Total deaths, 52; death rate, 14.0; from phthisis, 2.

Oswego, 22,000: Total deaths, 22; death rate, 11.45; from phthisis, 3.

ALABAMA.—Mobile, 37,817, three months, ending June 30, '99: Total deaths, 330—193 colored; death rate, 28.64; from typhoid fever, 6; diarrhœal diseases, 30; phthisis, 35.

CALIFORNIA.—San Francisco, 360,000, June, '99: Total deaths, 495; death rate, 16.5; from typhoid fever, 6; "specific febrile," 16; diphtheria, 9; scarlet fever, 5; consumption, 67.

Los Angeles, 103,000, June, '99: Total deaths, 116; death rate, 13.63; from diphtheria, 3; cerebro-spinal meningitis, 2; consumption, 20.

CONNECTICUT.—The Secretary of the State Board sums up 165 towns, 910,294, June, '99: Total deaths, 1,048; death rate, 13.8; from typhoid fever, 2; diphtheria, 7; phthisis, 106.

New Haven, 116,500:- Total deaths, 128; death rate, 12.6; from phthisis, 13.

Hartford, 77,085: Total deaths, 126; death rate, 18.6; from phthisis, 8.

Bridgeport, 66,757: Total deaths, 99; death rate, 17.4; from phthisis, 12.

Waterbury, 50,000: Total deaths, 52; death rate, 12.4; from phthisis, 2.

DISTRICT OF COLUMBIA.—280,250, 3 weeks, July 29, '99: Total deaths, 356; death rates, white, 17.92; colored, 27.51: 22.71; deaths from typhoid fever, 5; diphtheria, 6; cerebro-spinal fever, 6; phthisis, 39; acute respiratory diseases, 11.

FLORIDA.—Forty-five counties and two cities, with a total population of 464,639, report for June, '99, 458 deaths, representing an annual death rate of 11.8 per 1,000. From typhoid fever, 22; consumption, 35.

GEORGIA.—The Brunswick "Times" of Aug. 6 reports efforts now under way to revive and maintain a State Board of Health. Mr. A. V. Wood, who was the original and prime mover in the efforts to establish a State Board of Health in Georgia during the summer of 1893, has never ceased to agitate the question whenever an opportunity presented itself. He heartily endorses the present movement, and says he will give it all the encouragement and support that he can. Georgia is the only State in the Union that has not a State Board of Health, and if ever a State needed one Georgia does. In all other matters Georgia is well advanced, but in the matter of looking out for the health and welfare of her citizens this State is far behind the times.

ILLINOIS.—Chicago, 1,650,000. Official report delayed. "News" of August 7th: Twenty more voluntary medical inspectors are wanted by the Health Department.

There are at present fifty-eight young physicians devoting a large portion of their time to house-to-house canvassing in the poorer districts, and the results have been so gratifying that it has

been decided to extend the inspection field until it embraces all the thickly populated sections of the city.

Following is a statement of mortality for the week ended Aug. 5, 1899, compared with the preceding week and with the corresponding week of 1898:

	Aug. 5, 1899.	July 29, 1899.	Aug. 6, 1898.
Total deaths—all causes.....	465	546	432
Death rate per annum per 1,000.....	14.68	17.27	13.90

The only disease showing a marked increase was typhoid fever —the result of the water contamination of four or five weeks ago, from which there were 9 deaths. This increase, however, is not so marked as usual, and there is reason to believe that the daily publication of the sanitary quality of the public water supply is having a salutary effect in causing greater care in the use of hydrant water without boiling or other purification when it is announced to be "bad" or "suspicious."

"The prevalence of typhoid fever in this city is more directly influenced by the local condition than by the stage of ground-water as affected by precipitation. A rainfall of more than three-fourths of an inch in twenty-four hours is sufficient to flush out the lake-emptying sewers and frequently to turn the current of the foul river lakeward. This is followed by a rise of the sanitary-quality-of-the-water line into the 'pathogenic' spaces—more or less promptly, according to the direction and velocity of the wind movement. This rise is followed, usually within a week, by a rise in the line of deaths from the acute intestinal diseases, and within three weeks by a rise in the typhoid fever death-line, which latter culminates in from five to seven weeks unless fresh pollution occurs."

By authority of an amendment to the act creating and establishing a State Board of Health, passed by the Forty-first General Assembly, the officers of the board are now busily engaged in bringing about much needed reform in the conducting of lodging-houses in this city. H. C. Fancher has been appointed chief inspector. He and Dr. M. Meyerovitz, a member of the board, and John A. Barnes, attorney for the board, are at present engaged in an inspection of the various lodging-houses in the city. They have already discovered that there is plenty room for reform, and say that their efforts thus far establish the wisdom of the amendment

to the law. For instance, they have found rooms 20 by 40 feet in basements where from fifty to sixty people were huddled together.

INDIANA.—Summary of vital statistics from report of State Board of Health for quarter ending June 30, 1899: Total number of deaths from all causes, 4,389, an increase of 1,021 reported for corresponding quarter of last year. This increase is most largely due to better work of health officers in collection.

Deaths from phthisis, 615; cholera infantum, 30; cerebro-spinal meningitis, 177; typhoid fever, 74 (14 more than corresponding quarter of last year); smallpox, 240 cases, 3 deaths. Total number of births, 7,395. White males, 3,765; white females, 3,499; colored males, 45; colored females, 56. Triplets reported from Huntington, Jefferson, Miami and Pike counties. Still-births, 141; twins, 89; illegitimate, 117. Marriages, whole number, 5,267; colored, 93.

Bulletin for July disease in Indiana says: "The diseases which increased in area of prevalence were diarrhœa, cholera morbus, dysentery, cholera infantum and malarial fever. All of these, except malarial fever, are called filth diseases, and would not appear in the hot months if we would but so dispose of all excreta as to prevent access of flies and prevent the same from getting into the water supply.

"The diseases decreasing in area of prevalence were typhoid fever, erysipelas, measles, bronchitis, pleuritis, whooping-cough, diphtheria, pneumonia and scarlet fever. All but the first three are called house diseases, because they are favored by foul air, which can only exist in badly ventilated, damp houses.

"Dysentery has been epidemic in several towns, notably in Liberty Center and Covington. The total deaths so far at these two places is 26, with probably 100 cases. All of this loss and sorrow could have been prevented by simply properly caring for excreta."

IOWA.—State Board bulletin for July reports infectious diseases for the preceding month:

Cerebro-spinal meningitis, Burlington. Cholera infantum, Burlington; Cedar Rapids; Des Moines. Diphtheria, Amsterdam township, Hancock county. Measles, Sibley. Scarlet fever, Dawson township, Greene county; Bennett; Grundy Center. Typhoid fever, Buffalo Center. Whooping-cough, Boone; Burlington.

Deaths in 10 towns, with an aggregate population of 182,600, 118; death rate, 7.74.

KENTUCKY.—The State Board of Health of Kentucky gives notice ("Southern Recorder," Aug. 10,) to all concerned that it will hereafter refuse to recognize, as a basis for certificates to practice medicine, diplomas from any medical college which does not, in good faith, comply with the requirements of the American Medical College Association, the American Institute of Homeopathy and the American Electric Medical College Association, respectively, both as to preliminary education and four years' course of study. This means that no school that graduates three-year students will be recognized in this State hereafter.

LOUISIANA.—New Orleans, 300,000 (90,000 colored), June, '99: Total deaths, 738—280 colored; death rates, white, 26.17; colored, 37.33: 29.52. Deaths from phthisis, 77; cerebro-spinal fever, 10; typho-malarial fever, 5; typhoid fever, 21.

MASSACHUSETTS.—Boston, 541,827, June, '99: Total deaths, 780; death rate, 17.27; from diphtheria, 11; typhoid fever, 5; cerebro-spinal fever, 5; consumption, 88.

August 1.—The "Traveler" publishes the figures given out by the Clerk of the Board of Health this morning as follows: Cases of diphtheria, January 1 to August 1, 1898, 931; 1899, 1,449. Scarlet fever, 1898, 501; 1899, 720. Typhoid fever, 1898, 190; 1899, 239. Total increase in contagious diseases over the corresponding months in 1898, 786.

Mr. Harold Kelsey Estabrook, agent of the Tenement House Committee of the Twentieth Century Club, has submitted the report ("Evening Globe," Aug. 1) of the committee on the condition of the tenement houses in the slums of Boston.

The Board of Health has ordered more houses vacated and demolished during the past year than in preceding years. During 1898 the Board of Health ordered 215 houses vacated, as compared with from 77 to 153 in each of the twelve years preceding. Of these 215 houses ordered vacated in 1898, nearly one-half, or 105, were actually vacated for a longer or shorter time, as compared with 6 or 10 houses in each of several preceding years.

Investigation discovers that no suffering resulted to poor families because of the action of the board. Increased facilities for reaching the suburbs and reduced rents for old houses enable them to often better their condition with no additional expense.

August 8: The State Board of Health has detailed an inspector to begin at once an examination of picnic grounds and certain

summer resorts in different parts of the State in relation to their sanitary conditions. Among the places to be visited may be mentioned Rockport, Salisbury, Revere, Lynn, Nahant, Swampscott, Haverhill, Lawrence, Lowell, Bridgewater, Fall River, Taunton, West Medway, Brookfield, Worcester, Northampton, Westfield, Palmer, Springfield, Holyoke, Fitchburg, Athol, Gardner and Pittsfield. The places to be visited have been decided upon and the inspector is about ready to start out on the inspection tour. Special notice will be taken of the water supplies at the different parks, picnic grounds and other places where large numbers of persons congregate habitually for amusement, and the sewerage systems will also receive careful consideration.

MICHIGAN.—The Secretary of the State Board reports for July: As compared with the preceding month, dysentery, cholera infantum, cholera morbus, typhoid fever, diarrhœa and inflammation of bowels increased in area of prevalence. Whooping cough, pneumonia, remittent fever, cholera morbus, consumption, intermittent fever, erysipelas, cholera infantum and typhoid fever were less prevalent. Consumption was reported at 189 places, measles at 83 places, typhoid fever at 79 places, scarlet fever at 58 places, diphtheria at 35 places, whooping cough at 35 places, cerebrospinal meningitis at 12 places and smallpox at 1 place.

Deaths reported to the Secretary of State for the month of July, 2,399. An increase of 195 over the number for the previous month. Death rate 12.1. Deaths of infants under 4 years of age, 649. Deaths from phthisis, 142; other forms of tuberculosis, 45; typhoid fever, 41; diphtheria and croup, 17; scarlet fever, 7; measles, 6; whooping cough, 20; pneumonia, 66; diarrheal diseases of children under 5 years of age, 265; cerebrospinal meningitis, 52; cancer, 107; accidents and violence, 175. Population estimated for July 1, 1899, white, 1,627,000; colored, 23,000: 1,650,000; total deaths from all causes during the month of June, 1899, 1,918; colored, 50; monthly death rate, June, 1899, per 1,000 of 1,650,000 population, white, 1.15; colored 2.17: 1.16; annual death rate, twelve months ended June 30, 1899, per 1,000 of mean population, white, 14.55; colored, 28.39: 14.75. Deaths from phthisis, 216; other tubercular diseases, 39; from diphtheria, 63; scarlet fever, 43; typhoid fever, 28; measles, 29; other zymotic diseases, 6.

MINNESOTA.—Minneapolis, 225,602, June, '99: Total deaths, 119; death rate, 9.31; from typhoid fever, 5; cerebro-spinal fever, 4; diphtheria, 1; phthisis, 11.

St. Paul, 215,582, June, '99: Total deaths, 120; death rate, 7.20; from diphtheria, 4; phthisis, 16.

MISSOURI.—St. Louis, 623,000, June, '99: Total deaths, 741; death rate, 14.16; from typhoid fever, 5; diphtheria, 12; cerebro-spinal fever, 10; phthisis, 71.

Kansas City, 200,000, June, '99: Total deaths, 202; death rate, 12.12; from diphtheria, 1; consumption, 7.

NEW JERSEY.—Newark, 235,000, 4 weeks, July 22, '99: Total deaths, 411; death rate, 22.26; from diphtheria, 6; phthisis, 45.

Paterson, 115,944, June, '99: Total deaths, 121; death rate, 14.0; from typhoid fever, 1; diphtheria, 8; cerebro-spinal fever, 16; phthisis, 12.

"Sentinel," August 5: Typhoid fever is increasing in Newark to an extent that is somewhat alarming to the Board of Health officials. New cases are being reported at an average of more than two a day. This average, if continued, will bring the rate for August to seventy cases.

NORTH CAROLINA.—Twenty-two towns, population 151,138 (63,370 colored), report for June, '99, 53 deaths, 131 colored; death rates, white, 16.7; colored, 24.8: 20.1; deaths from consumption, 18; diarrhœal diseases, 42; malarial fever, 10; typhoid fever, 8. Deaths under five years of age, 107.

OHIO.—Sanitary Bulletin for July: *Smallpox*, since the first outbreak, April 6, 1898, to August 1, 1899, of 2,022 cases and 30 deaths. Since January 1, 1899, 1,353 cases and 25 deaths have been reported.

While these reports show that there is at this time less smallpox in Ohio than at any time during the last year, the prospects are in favor of the realization of the prediction of the "Bulletin" of some months ago, viz.: That smallpox would continue to appear here and there during the summer, only to prevail again, more or less widely, during the winter of 1899-1900. The conditions for its epidemic prevalence still exist in many places, i. e., a preponderance of unprotected, that is, unvaccinated persons.

Cases and deaths of other infectious diseases from 61 places, during eight weeks ending July 29, with an aggregate population of 1,465,484: Diphtheria, 90 cases, 15 deaths; scarlet fever, 224 cases, 5 deaths; typhoid fever, 179 cases, 4 deaths; whooping-cough, 55 cases, 11 deaths; measles, 353 cases, 4 deaths.

Cincinnati, 405,000, June, '99: Total deaths, 456; death rate, 13.51.

The Health Department is managed, says the "Commercial Tribune," with a view to the best possible sanitation of the city, and the result has been accomplished in spite of the troubles with smallpox and other contagious diseases, which at one time threatened to become epidemic.

Cleveland, 395,000, June, '99: Total deaths, 394; death rate, 11.9; from typhoid fever, 12; diphtheria, 2; phthisis, 16.

PENNSYLVANIA.—Philadelphia, 1,266,832, 4 weeks, July 22, '99: Total deaths, 1,852; from typhoid fever, 28; cerebro-spinal fever, 6; diphtheria, 59; phthisis, 235.

Pittsburg, 305,000, 5 weeks, July 24, '99: Total deaths, 607; death rate, 20.5; from typhoid fever, 23; phthisis, 20.

SOUTH CAROLINA.—Charleston, 65,165 (36,295 colored), 4 weeks, July 29, '99: Total deaths, 148, 110 colored; death rates, white, 16.9; colored, 39.3: 28.1; from phthisis, 5.

VIRGINIA.—Yellow fever was discovered at the National Soldiers' Home, at Hampton, July 29th. *Since* then, to the time of this writing, August 15th, about thirty cases have been reported there and in the vicinity. How many cases had appeared before July 29th is doubtful. In the words of our esteemed contemporary, "The Virginia Medical Semi-Monthly," "As soon as the endemic at or about Hampton is ended (which will probably be in a week or so), and if the disease shows no tendency to spread, the history of the present endemic will be written up." Meanwhile, more about it on another page.

WASHINGTON.—Seattle, 75,000, June, '99: Total deaths, 46; death rate, 7.27; from phthisis, 4.

WISCONSIN.—Anthrax is reported (Milwaukee "Sentinel") Aug. 6, at Mellen. Dr. Wingate, secretary of the board, wrote yesterday to Dr. Harrison, the Ashland member of the Board of Health, asking for particulars, and as soon as these have been re-

ceived Dr. Wingate will act as circumstances require to prevent the spread of the disease.

Milwaukee, 280,000, June, '99: Total deaths, 262; death rate, 11.41; from typhoid fever, 6; diphtheria, 3; tubercular diseases, 30.

August 9, Milwaukee "News."—Every cow, the milk from which is sold in the city of Milwaukee, is to be tested for tuberculosis.

That is the plan which Health Commissioner F. M. Schulz now has in hand, and he says that it will be carried out as soon as possible. He is convinced that the only way to guard against tuberculosis being communicated to individuals through the city milk supply is to inspect every cow used to supply milk for the city trade.

CUBA maintains remarkable healthfulness compared with previous years. Perhaps the latest outbreak of yellow fever in Santiago would have been just as promptly stamped out, even if Gen. Wood had not hastened back to the city as soon as he heard of it, but, however that may be, his arrival was marked by the almost immediate squelching of the fever, and a new sheaf of laurels was reaped by the great administrator, who is both soldier and doctor. Generals Wood, Wilson and Ludlow, too, deserve high praise for their efficient administration of Cuban affairs. By their intelligence, energy and good management they have enforced the laws, brought order out of confusion, improved the sanitary condition of the island and won the respect and confidence of the people. The conditions which confronted the United States authorities when they took possession of Havana were serious enough to daunt the most determined reformer. The city was filthy in the extreme. The deaths from yellow fever alone in 1896 were 1,539, and in 1897 numbered 1,056, while the deaths from the same cause even during the years from 1890 to 1894, under normal conditions, averaged over 400 a year. The work of General Ludlow and aides consisted in a cleansing of the city. Hotels, cafes, theatres and all public places have been disinfected, and after the initial work was done a rigid system of inspection continued. Over 3,000 cesspools have been closed up; streets and sewers have been cleaned; sewers have been extended; houses have been connected with sewers, and of the great number of wells in the city very many have been filled in. The refuse is no longer

dumped in the harbor, but as much as possible is burned in the new cremation plant, and the remainder is towed out to sea. The result is that Havana has never before been so healthful. The deaths from yellow fever this year have numbered less than a dozen all told. The Americans are teaching valuable lessons to the Cubans, and at present they are enforcing the teaching with admirable vigor, skill and success.

PORTO RICO.—A board of health has been constituted under the military government, consisting of a medical representative, each, of the army, navy and marine-hospital services, and three civilian physicians. The board for the present is composed of six members, as follows: Major John Van R. Hoff, Surgeon, U. S. Army, Chief Surgeon of the Department; Surgeon Arthur H. Glennan, U. S. Marine Hospital Service; Surgeon F. W. F. Wieber, U. S. Navy; Drs. George G. Groff, Gabriel Ferrer and Ricardo Hernandez. The Chief Surgeon of the Department will act as President of the board, and Dr. George G. Groff is appointed Secretary and Treasurer. Their duties are defined in detail in General Order No. 102 of the Department Commander, and include not only supervision of health matters and vital statistics to an extent exceeding the functions of the average health board in this country, but also the supervision of public institutions, asylums, jails, court rooms, theatres, etc., and the licensing and registration of physicians, pharmacists, undertakers and midwives. Its powers are broad, but apparently well defined, and with an intelligent but scientific board, such as is practically insured in this instance by its composition, health and collateral matters will be well looked after in Porto Rico. The advantages of the Island as a winter resort are said to be very great, and there is nothing that will more enhance them than the general knowledge that sanitary supervision is thorough and complete.

CITY OF MEXICO, 344,377. Bulletin for month of June: Total mortality, 1,405. From tuberculosis, 128; typhoid fever, 58; smallpox, 20; diarrhœal diseases, 433. Annual death rate, 48.8.

VERA CRUZ.—Yellow fever continues prevalent. For the two weeks ending July 27, 37 deaths from it.

THE BUBONIC PLAGUE outbreak in Oporto has startled the sanitary authorities of all the large capitals in Europe.

London, August 14.—The bubonic plague has reached Portugal, which shows that the "British Medical Journal" was correct, in a measure, when it said a month ago that it was only a question of time before the plague would reach Europe and thence America.

The "Daily Mail" publishes the following dispatch from Oporto, Portugal:

"The suspicious disease which broke out here recently has become epidemic. Its symptoms are identical with those of the bubonic plague. The doctors disagree as to its precise character, but admit that it must be allied to the dreaded Eastern malady. Sanitation and the water supply here are bad, and the wildest rumors are current. The authorities, however, are taking energetic measures."

Oporto, Aug. 15.—Since the outbreak of the plague here there have been twenty-six cases and eleven deaths from the disease.

Cadiz, Spain, Aug. 15.—Quarantine has been declared against all Portuguese ports on account of the suspicious sickness at Oporto.

Madrid, Aug. 15.—The Gazette to-morrow will announce a quarantine on everything arriving from Portugal. Sanitary posts have been established on the frontier for the inspection of travelers.

MORTALITY STATISTICS ABROAD FOR THE SECOND QUARTER 1899.—Population; total mortality; annual death rate per 1,000; deaths from measles; scarlatina; typhoid fever; diphtheria; whooping-cough, and phthisis:

London, 4,746,752; 18,843; 15.1; 696; 84; 88; 373; 528; 1,991. Glasgow, 733,903; 3,560; 19.2; 179; 44; 22; 39; 59; (?). Liverpool, 634,212; 3,586; 20.6; 104; 33; 53; 36; 49; (?). Manchester, 543,902; 3,145; 22.9; 312; 10; 10; 16; 87; 302. Birmingham, 514,956; 2,374; 18.3; 39; 2; 20; 28; 40; (?). Leeds, 423,889; 1,804; 15.3; 40; 16; 13; 53; 29; (?). Sheffield, 361,169; 1,637; 18.2; 23; 16; 16; 98; 18; (?). Dublin, 349,594; 2,262; 25.6; 8; 10; 31; 17; 45; 325. Bristol, 320,911; 1,253; 15.7; 10; 2; 6; 3; 33; (?). Belfast, 304,610; 1,919; 24.9; 61; 9; 44; 10; 62; 315. Edinburgh, 298,927; 1,329; 17.8; 25; 13; 7; 6; 53; 139. Nottingham, 239,304; 1,039; 17.4; 38; 13; 7; 5; 13; (?). Bradford, 236,241; 1,018; 17.3; 8; 36; 10; 6; 21; (?). Hull, 234,270; 1,016; 17.6; 11; 9; 3; 5; 60; (?). Newcastle, 228,625; 986; 17.5; 12; 5; 1; 5; 24; (?). Salford, 218,244; 1,119; 20.6; 60; 6; 13; 16; 24; (?). Leicester, 213,851; 819; 15.8; 4; 9; (?); 68; 23; (?).

Portsmouth, 190,741; 769; 16.4; 17; 6; 11; 27; 14; (?). Cardiff, 185,826; 592; 13.3; (?); (?); 2; 6; 43; (?). Brighton, 123,226; 520; 16.9; (?); 3; 6; 6; 6; (?). Norwich, 113,266; 444; 15.8; 1; 6; 3; 7; 12; (?). Plymouth, 100,637; 491; 19.7; 2; (?); 1; 5; 25; (?). Brussels, 551,011; 2,237; 16.1; 48; 4; 27; 14; 13; 282. Amsterdam, 515,027; 1,874; 14.6; 1; 3; 7; 14; 21; 220. Rotterdam, 309,307; 1,299; 17.4; 1; 2; 5; 18; 24; (?). The Hague, 199,285; 766; 15.6; 2; (?); (?); 10; 3; (?). Paris, 2,511,629; 12,971; 19.4; 102; 72; 162; 92; 131; 2,513. Lyons, 488,798; 2,417; 20.5; 17; 7; 16; 15; 11; 389; Bordeaux, 256,906; 1,317; 20.5; 3; (?); 13; 18; (?); 143. Lille, 222,779; 1,297; 23.5; 5; (?); 1; 10; 48; 227. Saint-Etienne, 135,784; 708; 20.1; (?); 6; 2; 5; 1; 101. Roubaix, 124,447; 586; 18.8; 1; (?); 3; 2; 10; 83. Havre, 119,470; 798; 26.7; 3; 1; 13; 5; 14; 174. Rouen, 114,817; 826; 28.7; 19; 3; 5; 4; 7; 139. Reims, 107,963; 557; 20.7; (?); 1; 3; (?); 1; 80. Nancy, 99,012; 607; 24.5; 6; 3; 19; 1; 1; 75. Dunkirk, 39,718; 190; 19.1; (?); (?); 2; 1; 2; 23. Pau, 33,072; 158; 19.1; (?); (?); 2; (?); (?); 35. Berlin, 1,747,903; 7,913; 18.2; 182; 157; 12; 131; (?); 1,112. Hamburg, 675,351; 2,841; 16.8; 2; 4; 10; 24; 59; 366. Munich, 444,000; 2,865; 26.3; (?); 9; 2; 23; 30; 395. Leipzig, 430,765; 2,001; 17.8; 23; 28; 3; 16; (?); 287. Breslau, 406,461; 2,516; 25.4; 9; 34; 2; 20; 6; 379. Dresden, 389,300; 1,796; 18.8; (?); 8; 6; 14; 15; 254. Cologne, 353,000; 1,760; 20.6; 10; 5; 8; 26; 18; 183. Frankfort-on-Main, 250,932; 1,006; 16.3; 1; 1; 3; 8; (?); 211. Hanover, 234,676; 1,045; 18.2; 49; 8; (?); 17; (?); 130. Magdeburg, 223,460; 1,134; 20.4; 8; 59; 2; 30; (?); 133. Dusseldorf, 198,787; 847; 17.4; 1; 3; 3; 11; (?); 112. Kœnigsberg, 172,941; 1,006; 22.4; (?); 11; 20; 3; (?); 73. Nuremberg, 181,047; 1,374; 31.6; 22; 11; 1; 16; (?); 249. Chemnitz, 176,900; 1,012; 23.4; 1; 5; 2; 8; (?); 86. Altona, 153,025; 648; 15.9; (?); 2; (?); 4; (?); 84. Charlottenburg, 172,166; 660; 16.3; 8; 9; 1; 12; (?); 75. Stettin, 159,132; 903; 23.3; 2; 2; 3; 8; (?); 104. Stuttgart, 153,165; 596; 15.8; 8; 4; (?); 9; (?); 73. Bremen, 149,544; 561; 15.1; 6; 1; (?); 6; (?); 108. Elberfeld, 149,969; 675; 18.4; 60; 26; (?); 10; (?); 79. Strasburg, 145,307; 767; 21.4; 2; 1; 1; 8; (?); 82. Barmen, 134,768; 478; 14.4; 4; 5; 2; 4; (?); 72. Aix-la-Chapelle, 132,870; 752; 22.8; 17; 1; 1; 14; (?); 82. Dantzig, 129,378; 682; 21.2; 1; 1; 7; 3; (?); 70. Halle, 126,736; 732; 23.6; 9; 20; 3; 7; (?); 69. Brunswick, 125,536; 555; 18.0; 10; 1; 1; 7; (?); 67. Crefeld, 108,585; 373; 13.7; 4; 1; 3; 8; (?); 48. Essen, 109,012; 586; 22.1; 4; 13; 2; 13; (?); 64. Mayence,

78,759; 382; 19.5; (?); 1; 2; 3; (?); 57. Metz, 153,025; 246; 16.5; 1; 1; 3; 1; (?); 30. Berne, 55,472; 264; 19.3; (?); (?); (?); 9; 1; 46. Bâle, 101,724; 360; 15.1; 4; (?); (?); 2; 4; 72. Geneva, 90,708; 431; 19.6; 5; 2; (?); 5; 4; 84. Lausanne, 44,-266; 185; 17.7; 8; 1; 2; (?); (?); 29. Zurich, 161,726; 572; 14.3; 1; (?); 1; 2; 7; 96. Chaux-de-Fonds, 32,554; 101; 12.9; 2; (?); (?); (?); 2; 35. Vienna, 1,606,629; 9,203; 23.0; 278; 76; 11; 108; 68; 1,767. Buda Pesth, 666,722; 3,756; 22.2; 91; 69; 55; 49; 12; 696. Prague, 380,497; 2,109; 22.1; 61; 26; 17; 17; 17; 418. Cracow, 83,730; 756; 36.1; 18; 13; 2; 19; 7; 175. Copenhagen, 345,000; 1,595; 16.9; 17; 23; 9; 24; 23; 246. Christiania, 203,324; 984; 18.7; 2; 6; (?); 9; 7; 198. St. Petersburg, 1,193,817; 7,241; 21.7; 217; 92; 255; 212; 67; 972. Moscow, 1,023,817; 7,133; 28.5; 92; 64; 44; 133; 25; 804. Warsaw, 601,-508; 2,976; 17.8; 32; 66; 39; 25; 20; 342. Odessa, 400,600; 2,251; 22.5; 65; 17; 25; 30; 13; 289. Venice, 169,883; 996; 23.4; 46; (?); 10; 18; 6; 78. Bucharest, 248,009; 2,015; 32.4; 14; 66; 6; 68; 14; 231. Jassy, 70,065; 546; 31.1; 3; 7; 1; 4; (?); 62.

For the first quarter 1899: Manchester, 543,902; 3,441; 25.1; 225; 9; 25; 18; 46; 308. Marseilles, 447,344; 3,104; 23.9; 104; 1; 25; 27; 9; 230. Amiens, 88,731; 495; 22.3; 2; 1; 2; 2; (?); 57. Limoges, 77,703; 435; 22.4; 1; (?); 9; 5; 6; 76. Grenoble, 63,805; 341; 21.4; (?); 1; 2; 2; (?); 33. St. Quentin, 48,689; 257; 21.1; (?); (?); 1; 2; 2; 34. Nantes, 125,757; 753; 23.9; (?); (?); 14; 4; 1; 124. Metz, 59,065; 309; 20.8; 12; (?); 1; (?); (?); 35. Manheim, 115,386; 503; 19.2; 1; 1; 4; 5; (?); 64. Altona, 153,025; 598; 14.7; (?); (?); 2; 3; (?); 93. Trieste, 165,913; 1,238; 29.9; (?); 35; 16; 25; 9; 176. Lemberg, 140,-687; 968; 26.5; 4; 10; 7; 15; 3; 268. Gratz, 123,819; 1,021; 33.0; 59; 2; 6; 32; 10; 219. Brünn, 103,659; 806; 31.0; 36; 4; 2; 6; 4; 181. Debreezin, 61,300; 444; 28.9; (?); 3; 2; 5; (?); 62. Presburg, 53,200; 494; 37.1; 3; (?); 1; 3; (?); 52. Pilsen, 65,329; 329; 20.1; 1; 1; 1; 3; (?); 52. Lintz, 52,539; 467; 34.8; (?); (?); 2; 12; 7; 96. Helsingfors, 84,069; 391; 18.1; 1; 5; (?); 3; (?); 76. Warsaw, 601,408; 3,109; 18.6; 32; 77; 28; 37; 23; 395. Naples, 551,443; 3,694; 26.6; 2; 1; 12; 13; 3; 274. Turin, 344,-203; 1,733; 19.6; 3; (?); 10; 21; 73; 174. Palermo, 290,951; 1,701; 23.3; 8; 23; 25; 15; 4; 138. Geneva, 221,589, 1,217, 21.0; 3; (?); 15; 8; 2; 128. Florence, 199,080; 1,006; 20.1; (?); 2; 10; 4; 8; 101. Bologne, 154,234; 899; 23.3; 5; (?); 6; 6; (?); 59. Livourne, 105,066; 539; 19.9; 1; 1; 11; 20; (?); 52. Padua, 82,946; 478; 22.6; 1; 1; 6; 3; 8; 48. Alexandria, 78,320; 352;

18.0; (?); 1; 4; 2; 6; 35. Parma, 54,429; 439; 32.2; 19; 1; 10; 4; (?); 36. Milan, 472,934; 2,646; 22.2; 53; 5; 26; 56; 4; 213. Oporto, 171,467; 1,124; 26.2; 5; (?); 9; 23; 15; 139. Brescia, 70,737; 460; 26.0; (?); 1; (?); 6; (?); (?). Madrid, 508,880; 4,156; 32.7; 45; 8; 45; 35; 38; 437. Bucharest, 248,009; 1,951; 32.5; 21; 55; 9; 83; 19; 262. Algiers, 96,642; 558; 23.1; 9; (?); 6; 1; 7; 59. Cairo, 534,677; 4,760; 35.7; 20; (?); 162; 43; 2; 288. Alexandria, 273,653; 2,409; 35.2; 10; (?); 10; 9; (?); 153. Damietta, 31,285; 200; 25.6; (?); (?); 3; (?); (?); 2. Suez and Ismailia, 19,526; 127; 26.0; (?); (?); 1; 1; 1; 11. Port Said, 30,773; 160; 20.8; (?); (?); (?); (?); (?); 8.

THE DECREASED BIRTH RATE IN FRANCE.

One hundred years ago ("Medical Magazine") it was reckoned that the Great Powers of Europe numbered about 98,000,000 inhabitants, and of these 26,000,000, or 26.5 per cent., were French; to-day, out of about 300,000,000, only 38,000,000, or about 12.6 per cent., belong to France. As Dr. Henry May has shown, the English birth rate is also declining, though at a much less rate, and it is probable that the same causes as are at work in France are making their influences felt in England also. The principal of these causes is undoubtedly one which is well described by a recent writer on the subject in the "Journal de Médecine de Paris": "The dearth of children in France is due to the fact that the French people do not choose to have families. This defective natality cannot be laid to the charge of poverty. The richer a Frenchman, the fewer children he has. This is equally true in town and country. * * * Grenoble, one of the poorest parts of Paris, heads the list for births, while the Champs Elysées is at the foot." That the above view is correct is borne out by a consideration of the fecundity of marriages. The number of legitimate births annually per 1,000 married women is 115 in France, 184 in Italy, 186 in Norway, 190 in England, 202 in Germany, and 205 in Scotland. According to the 1891 census, there were in France 22 families out of every 100 which had only 2 children living, and 24 out of every 100 families which had only 1 living child. The so-called neo-Malthusianism is principally responsible for the above disastrous conditions. Malthus and his disciples, in their zeal to prevent an over-population—which is, to say the least, a very remote danger—have "o'erleapt" themselves, and the French will have them to thank if ever she suffers eclipse as a military nation.—"Medical Record."

BOOK REVIEWS.

KNOPF. Pulmonary Tuberculosis. Its Modern Prophylaxis and the Treatment in Special Institutions and at Home. Alvarenga Prize Essay of the College of Physicians of Philadelphia for the year 1898, revised and enlarged. By S. A. KNOPF, M.D. (Paris and Bellevue, N. Y.) Physician to the Lung Department of the New York Throat and Nose Hospital; former Assistant Physician to Professor Dettweiler, Falkenstein Sanatorium, Germany; Vice President of the Pennsylvania Society for the Prevention of Tuberculosis; Fellow of the American Academy of Medicine; Laureate of the Academy of Medicine of Paris, etc. With descriptions and illustrations of the most important sanatoria of Europe, the United States, and Canada. Octavo. Price, net, $3. P. Blakiston's Son & Co., 1012 Walnut street, Philadelphia, Pa.

The supreme importance of the subject of this treatise is its justification, notwithstanding the multiplicity of works on it during recent years and its being the teeming subject of the day in periodical literature. The author has been among the foremost to grasp the but recently recognized etiology of pulmonary tuberculosis and a pioneer in the investigation of curative and preventive methods. Beginning his investigations, he says (introductorily), at Los Angeles, California, where thousands of consumptives from all over the United States flock in, winter after winter, many of them hopelessly advanced in their disease, others with insufficient means to enable them to remain idle long enough to get well, all believing that the glorious climate of Southern California alone would suffice to restore them to health, he was there much impressed with the urgent need of a more timely and systematic treatment independent of climate. Thoroughly familiarizing himself with the literature of the subject, he extended his observations by an extensive trip, in which he visited, in both continents, some thirty sanatoria, special hospitals and numerous health resorts consecrated exclusively to the treatment of pulmonary tuberculosis. This work is the sum of his observations and practice—for his visit comprehended the rare opportunity of being for some time assistant to Dettweiler at his famous Sanatorium Falkenstein —during the trip, and subsequent experience as physician to the

Lung Department of the New York Throat and Nose Hospital. Altogether, it is an admirable summary of the results of modern methods in the treatment and prophylaxis of pulmonary tuberculosis, and the most complete account of sanatoria and sanatorial management for that disease hitherto published.

PROCEEDINGS OF THE CONNECTICUT MEDICAL SOCIETY, 1899. One hundred and seventh annual convention, held at Hartford, May 24th and 25th. 8vo. Pp. 418. Published by the Society. N. E. Worden, M. D., Secretary, Bridgeport. It comprehends some twenty papers on subjects of interest to all medical practitioners, and one-third of them at least: Insects as Etiological Factors in Disease, by C. C. Beach, M. D.; Spread and Prevention of Tubercular Disease, committee report; Decimation of the Race by Tubercle Bacilli, by E. P. Douglass, M. D.; Diseases of the Spanish-American War as seen by L. B. Almy, M. D., late Major and Chief Surgeon, U. S. V.; Milk: Its Consumption, by F. C. Graves, M. D.—of interest to practical sanitarians.

Obituaries: Drs. Wm. T. Lusk, Roswell Fox, Farnham O. Bennett, Oliver F. Treadwell, Winthrop B. Hallock, Wm. G. Brownson, M. N. Chamberlain, Henry Doutteil, Leonard J. Sanford, Daniel C. Leavenworth, Panet M. Hastings.

Officers Elected, 1899-1900: President, Chas. S. Rodman, Waterbury; Vice-President, Leonard B. Almy, Norwich; Treasurer, W. W. Knight, Hartford; Secretary, N. E. Worden, Bridgeport.—List of members appended.

LIGHTNING AND THE ELECTRICITY OF THE AIR.—Prepared under the direction of WILLIS L. MOORE, Chief U. S. Weather Bureau, by ALEXANDER G. MCADIE and ALFRED J. HENRY. Washington: Government Print.

An illustrated pamphlet of seventy-five pages, divided into two parts. Part I deals with the electrification of the atmosphere and the best methods of protecting life and property from lightning stroke. Part II gives statistics of the actual loss of life and property, including live stock in the fields, sustained in the United States during the year 1898. It opens with a succinct description of Franklin's kite experiment, and proceeds to a description of the recent investigations of atmospheric electricity by use of kites of greatly improved structure. It gives illustrated examples of destruction by lightning stroke, the benefit of rods and general directions for their erection.

Deaths by lightning in the United States, 1890-'98, 2,496, an average mean annual of 312. Monthly sums for the whole period: February, 4; March, 36; April, 122; May, 345; June, 678; July, 738; August, 496; September, 153; October, 35; November, 6; December, 3.

It is shown that the chief liability to lightning stroke is in the agricultural districts; the minimum liability in large cities and very thickly populated districts.

CONTEMPORARY LITERATURE.

THE CAUSE OF THE PHILIPPINE REBELLION.

The direct cause of the rebellion was not excessive taxation, priestcraft, industrial dissent, or military conscription, but all of these working through what Spanish writers call *politiquismo*, and describe as the root of all evil in the colonies. *Politiquismo* is political discussion with a view to reform, and demands for political and personal liberties. Before Magellan reached the Pacific, the Tagalos had laws, letters and foreign commerce; for three hundred years they have practised forms of religion established by Philip II., and have been as good Christians as can be produced by compulsion. The Tagalo language is spoken by some millions of the most active and progressive inhabitants, and is fit for modern uses, both in literature and business. Spanish is not understood by one-tenth of the civilized natives. The slow progress of education, however, and the admission of natives to academic standing as advocates and doctors, or even as notaries, pharmacists and schoolmasters, let in some light from the modern world. Many of the reforms demanded were covered by liberal laws enacted in Spain.—"Harper's Magazine."

THE BLACK SHEEP OF A DARK RACE.

Lynching usually takes place in agricultural districts where homes are more or less isolated, and therefore peculiarly exposed to the sort of depredations for which Judge Lynch metes out his swiftest and most direct punishment. The Southern States being almost wholly agricultural, white families are most frequently found surrounded by those of the black race. The latter are, as a rule, trustworthy, or at worst harmless; but among them are a cer-

tain number of depraved creatures sure to accept every opportunity to do evil. They are the black sheep of a dark flock. And just here is the place to note one of the cardinal faults of the Southern negroes: they rarely fail to harbor black criminals, no matter how heinous their acts. A fugitive reeking with the blood of murder, and of outrage infinitely worse, finds sympathetic asylum in every cabin he comes to. It is the race blindly justifying itself as against its superior enemy, the white man.

Before the negroes were freed there were very few heinous crimes booked against them in the South; since the close of the war the one supremely exasperating outrage has become more and more frequent; and as lynching certainly follows, mob executions have multiplied apace. Other crimes, sometimes not very terrible ones, have, however, called for Judge Lynch's swift punishment. A negro who obstructed a railroad and caused disaster and death was cooked upon a stove—a heathenish vengeance for a heathenish act; but in Indiana some white men were hanged because they were suspected of stealing and other minor felonies.—Maurice Thompson, in "New Lippincott's" for August.

REFORMATORIES FOR NEGROES.

Apropos of a recent paragraph in the "Weekly" about Mr. C. P. Huntington's gift of land in Hanover County, Virginia, for a reformatory for negroes, and of the accompanying statement that at present the only reformatory for negroes in the South is at Birmingham, Alabama, a Georgia correspondent writes:

"There is a reformatory at Milledgeville, Georgia. It is called 'The State's Farm,' but it was established for the purpose of separating young criminals and women from the more hardened and desperate kind. It is splendidly managed, and one of the institutions our State takes most pride in. It is likely that other Southern States have the same thing, but, like Georgia, not under the name of a reformatory. If Northern philanthropists will spend their money on reformatories instead of colleges, the South will co-operate with all her heart, soul, mind, body and strength.

"It is a mistaken report that you have heard that 'young lads and girls, especially negroes, are sent to the chain-gang for slight offences.' Young criminals are rarely sent to chain-gangs, and never for small offences, unless so often repeated as to make it necessary. Young criminals (under sixteen years) are usually

whipped—with their parents' consent—or fined, or made to 'knock rocks' for a short while on the county's roads.

"In all my experience I have never seen nor heard of a young *girl* being sent to the chain-gang."

This correspondent, like many other dwellers in the South, believes that the Southern negroes need training in conduct rather than free education. The Northern idea is that education quickens intelligence, and that increased intelligence surely, though perhaps slowly, makes for a higher plane of conduct. That may be true, and yet the first fruits of education may be disappointing and far from satisfactory to observers close at hand. This much at least it is safe to say, that, though there may be dispute about the usefulness of colleges for negroes, there will be none as to the great value of good reformatories and penal institutions. They are needed everywhere, but especially in the South, where the burden of misbehavior falls heavier on the tax-payer than with us.—E. S. Martin, in "Harper's Weekly."

THE RIGHT KIND OF BOYS' SCHOOL.

There are great differences in school—differences in the way boys are housed, fed, doctored, taught, and disciplined; differences in atmosphere and associations—so that a thoroughly good school is one of the best things going. But schools don't make boys, and, moreover, the social advantages of select schools for boys are apt to be exaggerated. There are some advantages about the schools where your boy is liable to meet Heaven knows who that schools which do not expose him to that possibility lack. To know more than one kind of boy enlarges a lad's experience, and is likely to do him good. As a rule, school friendships are less important and less lasting than those made a little later in life—in college, for example, when the tastes are more fully formed, and the process of selection of which friendship is a result can proceed on a more intelligent basis. Schoolboy friendships are apt to lapse, unless the association which they spring from is continued, whereas college friendships, being more mature, last much better. Willy White's loss, therefore, in missing the close association with the likely little boys that one always finds at Skidmore, will not be so serious as his mother thinks, nor will Tommy Green's associations with the scions of solvent houses be as demoralizing to his ideas about standards of living as *his* mother fears. A good school is one where a boy has a good chance to work out what is in him, and

to grow up under wise supervision. A good school is clean, and its atmosphere is clean. Its standard of conduct is high; it stimulates industry; it discourages lies, and, in so far as possible, it eliminates viciousness. It schools, but it does not create. It takes what it gets and makes what it can of it; but, after all, it is the raw material that counts most. Even a first-rate school does not make first-rate men out of second-rate boys, and it is a bad school indeed out of which a first-rate boy does not get advantage.—E. S. Martin, in "Harper's Bazar."

PLAY AND TEACHING.

Teachers who have taken charge of playrooms, playgrounds or vacation schools have met with many new problems and found it necessary to use entirely new methods from those employed in the ordinary schoolroom. There is not a set programme or set of rules to which the teacher authoritatively requires the children to adapt themselves, but the teacher must adapt herself to the interests and moods of the children before her. To succeed she must have the play spirit and must be tactful and resourceful, so as to be ready to meet every emergency.

If vacation schools and playgrounds are opened in every city and town, as it is hoped will be the case before many years, the effect upon the teaching in the regular schools will be profound. Mechanical teaching will rapidly decrease and our schools will change to some extent in subjects taught, and in a marked degree in the method and spirit of governing, teaching and learning. We may hope then to see something of the same energy, enthusiasm and intense application manifested in school work that we now see in play.

In the future teachers will be prepared for their work not so much by the study of methods of teaching, nor even by the study of the science of psychology and child study, helpful as they are, as by being brought into actual contact with children in their play activities as well as in their school work and by experience in serving as leaders and directors of children in such activities. Only a small part of a child can be observed under any one condition, but a very much larger portion of his real nature shows itself in play than in the work of any ordinary schoolroom; hence observing and directing the play of children are the best possible means of getting acquainted with them and learning to direct them.—From

"Play as a Factor in Social and Educational Reforms," by E. A. Kirkpatrick, in the "American Monthly Review of Reviews" for August.

CHILDREN AND DIRT.

The mother who would have her children healthy must not be afraid to have them occasionally dirty. While cleanliness is akin to godliness, there is a clean dirt that comes from contact with the sweet earth that is wholesome. Have the little ones bathed frequently, insist that they come to meals with immaculate hands and faces, but, between meals, have them so dressed that they are free to run and romp as they will.

An over-careful mother of an only child complained to a physician that her baby was pale and delicate. He asked to see the child, and the nurse brought in the two-year-old from the veranda, where he had been seated on a rug, looking at a picture-book. His dainty nainsook frock was spotless, as were also the pink kid boots and silk socks.

"What that child needs is wholesome dirt," was the physician's verdict. "Put a gingham frock and plain shoes on him, and turn him loose on the lawn or in the fresh earth. If he is not rosy and happy in a month, let me know."

At the expiration of the prescribed time the baby was transformed. The eyes that had been heavy were bright, the skin had acquired a healthful glow, the arms and legs were plump, and the languid, tired little patient had become a rollicking boy. The freedom, fresh air and clean dirt had, in a month's time, wrought a greater change in the child's system than all the skill of the medical fraternity could have effected.

Mothers who take their little school boys and girls away for vacation should let them romp at will out of doors, fish in the brook, ride on the hay, and wear strong shoes and clothing of which they need not be too careful. A child is much happier if untrammeled by too many "don'ts." And the mother is happier too if she need not say "don't" every hour in the day.—"Harper's Bazar."

JOSHUA'S RHEUMATISM—A CONTEMPORARY'S ACCOUNT OF HIS DOCTORING OF THE GREAT JEWISH GENERAL.

The August "Century" contains Part VI. of Mr. Stockton's "Vizier of the Two-Horned Alexander." This instalment includes Mr. Crowder's meeting with Moses, his curing of Joshua's

rheumatism, and his attempts to break up the friendship between Petrarch and Laura.

"In the days when I lived in a cave and gained a reputation as a wise and holy hermit, more people came to me to get relief from bodily ailments than to ask for spiritual counsel. You will remember that I told you that I was visited at that time by Moses and Joshua. Moses came, I truly believe, on account of his desire to become acquainted with the prophet El Khoudr, of whom he had heard so much; but Joshua wanted to see me for an entirely different reason.

"When Moses had gone away to a tent about a mile distant, where he intended to spend the night, Joshua remained, and as soon as his uncle was out of sight, he told me why he wished to see me. For some time he had been afflicted with rheumatism in his left leg, which came upon him after exposure to the damp and cold.

"I soon found that his ailment was a very ordinary one, which might easily be kept under control, if not cured, and I proceeded at once to apply remedies. Now I will mention that in those days remedies were generally heroic, and I think you will agree with me when I tell you how I treated Joshua. I first rubbed his aching muscles with fine sand, keeping up a friction until his skin was in a beautiful glow. Then I brought out from the back part of my cave, where I kept my medicines, a jar containing a liniment which I had made for such purposes. It was composed of oil, in which had been steeped the bruised fruit or pods of a plant very much resembling the Tabasco pepper-plant."

"Whoop!" I exclaimed involuntarily.

"Yes," said Mr. Crowder, "and Joshua 'whooped' too. But it was a grand liniment, especially when applied upon skin already excited by rubbing with sand. He jumped at first, but he was a soldier, and he bore the application bravely.

"I saw him again the next day, and he assured me with genuine pleasure that every trace of the rheumatism had disappeared. I gave him some of my liniment, and also showed him some of the little pepper pods, so that he might procure them at any time in the future when he should need them."

"CHRISTIAN SCIENCE."

Mr. W. A. Purrington, who contributed to the March number of the "North American Review" an article on "Christian Science

and Its Legal Aspects," which attracted much attention, pursues the subject in the August number of the "Review" in a paper which he entitles "The Case Against Christian Science." In making out his case, Mr. Purrington has gone to the writings of Mrs. Eddy and taken extracts from them, which he spreads out upon the page for the purpose of comparison or comment. In endeavoring to account for the vogue of Christian Science, Mr. Purrington says:

"Why is it then that Christian Science is credited with these marvellous cures, if its foremost professors cannot bring forward any better proofs of them than are afforded by certificates no better in manner and degree than those accompanying every quack nostrum that is advertised. The explanation is simple. In perhaps the majority of cases to which physicians are called, nothing more is needed than regimen and the mental stimulus that comes to the patient with knowledge that he is under skilled care. If a physician falls ill, he calls another to attend him, chiefly for the sake of this mental stimulus and to eliminate the personal factor. Drugs and surgical appliances may be needed in only a small proportion of cases; but, like a revolver in Texas, they are needed greatly when the occasion arises. Many diseases are self limited, many are feigned, or due to a fixed idea which may operate even in surgery, as when a patient, under the erroneous impression that his leg is broken, unconsciously inhibits muscular action and is unable to put foot to the ground, until dispossessed of the inhibitory idea by mechanical devices or any method, even Christian Science, changing the mental attitude. In all such cases, whatever removes the mental tension may be beneficial. Many patients would get well without any attendance at all."

Dr. Arabella Kenealy's "Rejoinder" to Mrs. Ormiston Chant in the discussion of "Woman as an Athlete," in THE LIVING AGE for July 22, is not only interesting as a bit of keen writing, but it communicates important physiological facts which, if generally understood, are at least very widely ignored.

To every one, but especially to those whose reading time is limited, the value of an unbiased journal of criticism must be apparent. LITERATURE is just such a journal. Its criticisms of new books are written by men whose opinions are looked up to the world over. Its literary news is authoritative, and the special

articles which appear in its columns are from the pens of the best known men of letters in this country and England.

A boy likes nothing better than to be kept busy. In summer when there is no school it is sometimes difficult to find healthy amusements. If a boy is interested in photography, the "Camera Club" in THE ROUND TABLE will tell him how to get the best results. If he has a taste for carpentering and mechanical work he will find Dan Beard's articles interesting, and in every number there are enough good stories to keep him out of trouble for a few days at least.

SOUTHERN EXTRAVAGANCE.—An Irish "gintleman" had occasion to visit primitive Tennessee some fifty years since. When he returned, he remarked to a friend that the Southern people were very extravagant. Upon being asked why so, he remarked, that where he stayed they had a *candlestick* worth eleven hundred dollars.

"Why, how in the world could it cost that much?" inquired a friend.

"Och, be gorry, it was nuthin' mor'n a big nager fellow holdin' a torch for us to eat by."

PUBLICATIONS RECEIVED.

Report of Supervising Surgeon-General, Marine Hospital Service, for 1898.

Some Statistics upon Sero-therapy in Tuberculosis. J. E. Stubbert, M. D., Liberty, N. Y.

Reasons and Authorities Favoring Educational Unification. Regents of the University of the State of New York, Albany.

The Neuropathic Origin of Stuttering. W. Sheppegrell, M. D., New Orleans, La.

The Shleigh Method of General Anesthesia. Ibid.

Precocious Menstruation and Precocious Pregnancy. C. C. Mapes, M. D., Louisville, Ky.

More About the Ethics of Adolescence. Ibid.

Shall Patients be Informed that they have Cancer or Syphilis? Ibid.

Appendicitis. Geo. W. Crile, M. D., Cleveland, O.

Urotropin in Cystitis. J. B. McGee, M. D., Cleveland, O.

Chronic Appendicitis the Chief Symptom and Most Important Complication of Movable Right Kidney. Geo. M. Edebohles, M. D., New York.

Relations of Movable Kidney and Appendicitis to Each Other. Ibid.

The Hernia Guarantee and the Minimum of Confinement after Operation. Ibid.

Chronic Nephritis Affecting Movable Kidney as an Indication for Nephropexy. Ibid.

The Etiology of Phthisis. R. W. Gardner, M. D., New York.

Formaldehyde Gas as a Germicidal and Disinfecting Agent. Sanitary Construction Company, New York.

Conservative Treatment of the Myomatous Uterus. Hunter Robb, M. D., Cleveland, O.

Secondary Abdominal Pregnancy after Traumatic Rupture of the Uterus. Ibid.

Treatment of Retrodisplacements of the Uterus. Ibid.

Case of Papilloma of the Ovary. Ibid.

The Intra-Uterine Application of the Chloride of Zinc. Ibid.

Bacteria Occurring in the Female Genital Canal and their Relation to Endomatritis. Ibid.

Bulletin of the Cleveland General Hospital, Cleveland, O.

The Warm Bath Treatment in Chronic Hepatitis. Otto Lerch, M. D., New Orleans, La.

A Case of Leukemia of the Splenic Myetogenous Variety. Ibid.

A Case of Lepra, Trophic Type. Ibid.

The Case of Mrs. Maybrick. Clark Bell, Esq., New York.

Perichondritis and Necrosis of the Arytenoid Cartilage. By W. Sheppegrell, M. D., New Orleans, La.

Appendicitis. H. O. Walker, M. D., Detroit, Mich.

Half Century of Sanitation. William Paul Gerhard, C. E., New York.

The Use of Gloves in Surgery. W. R. Lockett, Jefferson Medical College, Philadelphia.

Pulmonary Hemorrhages in Colorado. S. G. Bonney, M. D., Denver, Col.

Climatic Change and Serum Therapy in Phthisis. Ibid.

Thyreoid Treatment in Myxœdema. Ibid.

Functional Nervous Disturbances in Phthisis. Ibid.

Report of Kensington Hospital for Women, Philadelphia.

ANNOUNCEMENTS.

THE AMERICAN ELECTRO-THERAPEUTIC ASSOCIATION

WILL HOLD ITS NINTH ANNUAL MEETING IN WASHINGTON, D. C., SEPTEMBER 19-21, 1899.

Committee of Arrangements.—Drs. D. Percy Hickling, Chairman; Jos. Taber Johnson, G. Lloyd Magruder, Z. T. Sowers, Robert Reyburn, G. Betton Massey, Chas. R. Luce, Elmer Sothoron, Llewellyn Eliot, Clifton Mayfield.

Willards Hotel has been chosen for the headquarters, and special rates have been made for all interested in this meeting.

INTERNATIONAL CONFERENCE FOR THE PROPHYLAXIS OF SYPHILIS AND VENEREAL DISEASES, AND FOR THE STUDY OF METHODS FOR THE CONTROL OF PROSTITUTION.

IN BRUSSELS, SEPTEMBER 4 AND FOLLOWING DAYS.

Papers are to be read by Drs. Fournier, of Paris; Neisser, of Breslau; Lassar, of Berlin; Finger, of Vienna, and by a number of others prominent as students of these questions.

The committee have indicated the following as delegated to investigate conditions of prostitution in their respective countries:

Argentine Republic, Dr. Baldomero-Sommer, of Buenos Ayres; Austria, Dr. Finger, Vienna; Belgium, Drs. Bayet and J. Verhoegen, Brussels; Bosnia, Dr. Gluck, Savajevo; Chili, Dr. Valdes-Morel, Santiago; Denmark, Dr. Ehlers, Copenhagen; England, Dr. Geo. Ogilvie and Dr. Drysdale, London; France, Dr. Ozenne and Dr. Julien, Paris; Germany, Dr. Bleschko, Berlin, and Neisser, Breslau; Hungary, Dr. Rona, Budapest; Holland, Dr. Selhorst, The Hague; Italy, Dr. Tommasoli, Palermo, and Dr. Bertavelli, Milan; Norway, Dr. Axel-Holst, Christiania; Roumania, Dr. Petrini de Gaiatz, Bucharest; Russia, Dr. Petersen, St. Petersburg; Sweden, Dr. Welaoder, Stockholm; Switzerland, Drs. Jodassohn and Schmid, of Berne; Turkey, Dr. Von Duhring and Dr. Zotos, Constantinople; United States, Dr. Isadore Dyer, New Orleans.

THE SANITARIAN.

OCTOBER, 1899.

NUMBER 359.

MENTAL FATIGUE DUE TO SCHOOL WORK.

From "*Science.*"

The meaning of the results obtained by the different investigators of fatigue among school children has been much confused because either the experimenter has not proved that what he measured was fatigue at all or has so arranged his experiments that the influence of practice on the one hand, and of unwillingness and lack of interest on the other, have not been discounted. Especially when, as has so often been the case, the teacher gives the work as a part of the school routine one may be measuring only a conventional habit of the school children of doing less at a certain time of day, or an unwillingness to work due to ennui. What a person *does* do need not be a measure of what he *could* do.

The experiments, a summary of which follows, were devised in order to get an answer to the question: "Does the work of a school session fatigue the pupils mentally, make them really less able to do mental work, than they were at its commencement, and, if so, to what extent?"

The method was to give to a sufficient number of scholars a certain test which would measure their ability (in a certain direction, at least) to do mental work, early in the school session, and then to give this same test to a *different* lot of children of approximately equal general maturity and ability late in the session. The influence of practice is thus entirely obviated, as the scholars do not have the same sort of work twice. In order to save the results from being vitiated by differences in the general ability of the students, four different tests were used, and the pupils who had two of these tests early had the other two late, while those who had the first two late had the other two early. The influence of possible differences in the average ability of the two sets of students can thus be estimated. In order to make sure that the willingness and

interest of the pupils was a constant except in so far as due to causes outside our control, all the tests were given by myself.

The work given was: (1) a set of multiplication examples to be done in a given time; (2) a page of printed matter full of misspelled words which were to be marked in a given time; (3) two sets of nonsense syllables to be written from memory after a ten seconds' look at them, and (4) two sets of figures and one set of simple forms (*e. g.*, square, triangle) to be written from memory in the same way.

About 150 children (four classes) were given, 1 and 3 early and 2 and 4 late. An equal number of children in the same school grade were given 2 and 4 early in the school day, the other half late. In order to eliminate the influence on the work which excitement at my first visit, or being used to me or tired of me at my second visit, might cause, I made my first visit coincide with an early test in half the classes and with a late test in the other half. The early tests were all given between 10 minutes and 40 minutes after the opening of school in the morning, while the late tests were given between 40 minutes and 10 minutes before the close of school, half of them at the close of the morning and half at the close of the afternoon session.

Thus any general decrease in the amount or accuracy of the late work will be due to mental fatigue, or to some aversion to work caused by the school day and quite apart from the aversion to conventional routine work or to some factors yet to be demonstrated. And if there is no difference we can say with assurance that the day's work has not decreased the child's ability to work, that though he may in school do less in the latter part of the day it is not in any wise due to real exhaustion, to a lowering of his mental energy.

As a fact what difference there was between the early and late work was in favor of the *latter*. The multiplication test was given to 152 scholars early and 144 late. After reducing the amount done and mistakes made by the 152 to what would have been done by 144, and comparing the results obtained with the work of the 144 who had the test late, we find that the latter did nearly 14 per cent. more work and made less than 5 per cent. more mistakes.

The spelling work was given to 152 pupils early and 146 late. After estimating the work of 146 early pupils on the basis of what the 152 did and comparing with the 146 late, we find that the latter worked through 99.7 per cent. as many lines, marked about 2 per

cent. more words and marked 2.6 per cent. more words which should have been left unmarked.

The nonsense syllables were used with 152 pupils early and 148 pupils late. When reduced to an equality in numbers the late pupils did 97.5 per cent. as well as the early.

The figures to be remembered were given to 152 pupils early and 145 late. When reduced to an equality in numbers the late pupils did 89 per cent. as well as the early.

In remembering the simple forms the late pupils did 94.6 as well as the early.

It seems clear that the mental work of the school day does not produce any marked decrease in the ability to do further work. The data here given are somewhat influenced by certain factors, though not by practice. These factors will be fully discussed in a later report.

The multiplication, spelling and figure tests when given to about 300 children in another city showed the following results:

The multiplication test was given to 156 children early and to 154 later. When evaluated for 153 children the results show the latter to have done 86⅔ per cent. as much work, to have made 14.7 per cent. more mistakes. Taking together the work of all the children tested (594, 297 early, 297 late), we find that the children who did the work late did 2.9 per cent. *more* work, and made exactly the same number of mistakes.

The spelling test was given to 135 early and 128 late. When evaluated for 127 children the results show the latter to have worked through 92.7 per cent. as many lines, to have marked nine-tenths of 1 per cent. more words, and to have marked wrongly 87 per cent. as many words. Taking together the work of all the children tested, we find that those who did the work late worked through 94.9 per cent. as many lines, marked 1.5 per cent. more words and marked wrongly 93.7 per cent. as many.

The figure test was given to 156 children early and to 152 late. After reducing the results of the 156 to a basis of 152 we find that those who had the tests late did 17 per cent. *better.*

Taking together the work of all the children tested, we find that those who had the test late did almost 2 per cent. better than those who had it early.

Besides these three tests, which are of the same sort as some of those given to the first lot of children, there was given to this second lot a test with letters similar to the figure test. This test was

given to 140 children early and to an equal number late. Those doing the work late did 97 per cent. as well as those who had it early.

The factors mentioned as influencing the work of the first set of children were largely counterbalanced by factors at work in the second; one, however, should be mentioned. A certain circumstance probably lessened the work of one class (of 30) of the first lot of children during an early spelling test. So the early work in this test should probably be reckoned about 2 per cent. higher. On the whole, these additional data render more probable our previous conclusion that "the mental work of the school day does not produce any decrease in the ability to do mental work." A glance at the following table, which summarizes the more important data, shows this better perhaps than the detailed accounts already given.

Test.	No. of Scholars Tested.	Ratio of Late to Early Work.
Multiplication	297	102.9 per cent.
Spelling	273	101.5 per cent.
Figures	295	102.0 per cent.
Nonsense syllables.....	147	98.0 per cent.
Form	145	94.6 per cent.
Letters	140	99.0 per cent.

EDWARD THORNDIKE.

Western Reserve University, Cleveland, Ohio.

VENTILATION AND CLEANLINESS IN THE SCHOOLROOM.*

By DR. BURNHAM.

A great many important investigations have been made to determine the actual conditions of schoolhouses, and almost without exception they have been found to be in bad condition. The sanitary conditions and the air have been found to be bad. A consensus of opinions is of course to be found in regard to the effects of bad air. It has been declared that the work of the children in badly ventilated buildings has fallen forty per cent. When conditions are improved the change in working can be readily seen. The

*Abstract of Lecture at Wooster Summer School, July 24, 1899.—From "Boston Transcript."

first source of contamination is the expired air. Expired air contains only sixteen parts of oxygen, and the amount of carbon dioxide is very large. By decreasing the amount of oxygen in the first place, it is injurious and there are many actually poisonous constituents. It was thought that the carbon dioxide was the poison, and many methods were told of to get rid of it. But carbon dioxide, like other gases, diffuses. Again, it has been proved that it is not poisonous in itself, for it can be breathed when sufficiently mixed with oxygen without injury. It is said that carbon dioxide may be taken as a measure for the other impurities. When the carbon dioxide idea was exploded, the organic constituents of expired air were taken up. Brown-Séquard seemed to demonstrate, by a series of experiments, that an organic poison existed in expired air.

Until the last four or five years this opinion was held, but now it is doubted whether the small amount of organic matter is sufficient to contaminate the air to a dangerous degree. A number of experiments give results which show that there is no organic matter of a toxic quality. Determination of bacteria and of ammonia were made with but barely a sign of ammonia being found, while no bacteria, other than the ordinary air organisms, were found. Tests were made in the British army, and among civilians of the soldier age, and it was found that the death rate among the soldiers living in crowded and ill-ventilated barracks was much higher than among those outside. The first danger in schoolrooms, then, is inspired air, but it must be outside of the insufficient oxygen, the carbon dioxide and the organic poisons.

The various sources of dust, dirty shoes, books, clothes, chalk, make the second danger. They carry the micro-organisms. In a public school there were found from thirty to one hundred micro-organisms per cubic metre of air. The number of organisms in the air is not dependent upon the absolute number of organisms in the place, but upon conditions; the stirring and settling of the dust. One pupil breathes over 44,000 micro-organisms during the five hours' stay in the schoolroom. As to the causes of these micro-organisms, first the position of schoolhouse. The higher and freer the location will make them less. The number depends on the ventilation and cleanliness. Care in cleaning and keeping clean the room should be taken. Cleanliness in the children has a great deal to do with it. It was found that the number stood in relation to the age of the children, being greatest for younger chil-

dren. Most of the micro-organisms are harmless, but many of them may be pathological.

A large per cent. of the children may be in a weakened and diseased condition, and many may be more susceptible to disease. Hence the danger from these micro-organisms. Another danger is from the various sources of bad odors, from cloths and bodies of occupants, from decaying teeth of school children. It is shown that a large per cent. of the school children have decadent teeth. It is impossible to have pure air when there are so many decaying teeth, without proper attention. The heating apparatus is a source of danger. The chief trouble seems to be in over-heating, and in many cases there is escape of carbon monoxide and other poisonous gases. Various sources of contamination are from the surroundings when conditions are unsanitary. There is no consensus of opinion as to which of these is the most injurious, the organic matter in exhaled air appears not to be harmful, and it seems now that the other impurities, as dust and bad odors, as well as moisture and overheating, are the real causes of discomfort in school children. Two methods of overcoming this may be named. One may be called the method of dilution and the other by removing the source of contamination. The method hitherto employed has been dilution, and we have hitherto been satisfied with simple ventilation. The sensible thing is obviously to attempt to eliminate the source of pollution.

John Locke first instituted the idea of play because he believed in individuality and freedom. Play was recognized by Rousseau and Pestalozzi, but was not elaborated. Froebel was the father of the kindergarten. Professor Johnson, of Amherst, developed an idea of play to develop the muscles and brains by different movements. The vacation schools in some States are a furthering of the idea.

The play idea has been overstrained, and it is found that a child who has acquired a habit of simply playing will not be fitted for the harder, less interesting work of the higher schools. Play, from a pedagogical standpoint, means organized activity. The first object of play is in physical education. Many of the forms of physical education are found to be fatiguing and fail to give a child the rest and sense of freedom which he needs for relaxation. Children need not be driven to play.

The tendency of modern life is to centralization and intense specialization, and the playground will prepare children for this life

much better than the gymnasium. Play, to make physical exercise a basis for city life, is fundamental. Of the physical side of play the results are definite.

On the mental side it is largely a matter of speculation.

The largest psychological benefit of play is that it leads to quick judgment and adaptability. Children who are brought up away from their fellows are dreamy, living in several worlds. Such children are more thoughtful and have broader natures, but lack adapting power. Play, physically, gets one into the habit of doing things for the pleasure of doing them. Play increases the capacity of the individual for action.

Another, social rather than psychological, point is that play lengthens the period of childhood. To be free to grow until one is twenty or twenty-five, perhaps, lays the foundation for future greatness. Play, in keeping up childhood interest, preserves the vigor and optimism of youth.

The problem of the school system is peculiar to the present generation as a result of city concentration. The children in the country school have an advantage over the city school children in the way of playgrounds. In the English schools boys are made to play, and it is a question whether when a boy is made to play it does not take away all the pleasure to play.

The reason why most of the American youths do not play is from lack of opportunities and time. There is always a certain class of boys in a school who do not want to play, and these are the cases where play should be encouraged. In most of the schools in large cities it is a problem of playgrounds. It is a manifest impossibility to have playgrounds in metropolitan centres, and perhaps in such places it would be well to have playgrounds in the suburbs.

It is thought in Germany that it is a bad policy for the teacher to play with the older children, but it is probably because the teacher is looked upon there as an omnipotent ruler and causes constraint on the part of the children. In America it would be different. However, it should be part of the teacher's function to show what the plays are for and direct them. The school has a great function to perform on the athletics of the country, though there will always be a strong predominance of athletics in this country without the schools doing much. It is an important problem to decide on how our athletics of the country can be placed on a pure amateur basis.

TRAINING FOR BOYS.

BY SAMUEL SCOVILLE, JR.

The system of dieting used at most of our large colleges best represents modern ideas. At Yale the crew, eleven, nine and track athletes eat almost precisely the same things. The daily fare includes almost anything that a boy would find on his own home table, and everything is of the very best of its kind. Toasted bread is used instead of the ordinary kinds, oatmeal water (merely because it is safer, having been boiled) instead of the ordinary liquid, while coffee, tea, pastry, rolls, biscuits and heavy, cloying sweets of all kinds are, of course, forbidden. These are almost the only differences between training and ordinary fare. Soup and desserts of a simple kind, such as rice and bread puddings, two articles that are sternly prohibited by many of the boy captains at preparatory schools, are usually present on college training tables.

In fact, a boy should make no especial difference in his diet when preparing for athletics. If a certain article disagrees with him he should give it up, and he should never allow himself to eat or drink between meals; these are the only cautions to be observed in eating. If a boy be fond of milk, let him drink it at his morning and evening meals; not at noon, however. But here a warning is needed. A quart of milk is almost equivalent to a pound of meat, and it is an easy thing to take too much of it and swallow more nutriment than the system can assimiliate. Milk should be sipped slowly, not poured down by whole glassfuls. In drinking water, distinction should be made between the true thirst and that parched condition of one's throat which will come from running or rowing. After exercising violently, if a boy feels that he is too thirsty to wait until his next meal, let him rinse his throat and mouth and gargle the water a few moments, instead of drinking a large quantity, and he will find that very little will need to be absolutely swallowed to relieve his thirst. No more water than absolutely necessary should ever be taken, as it brings on excessive perspiration, which is weakening, and, as has been said above, it should be taken at meal times, *never* immediately before or during a game or race. It is not necessary for a boy to drink beer or ale while

training; in fact, our American trainers are beginning more and more to rule off ale from their training tables. Tobacco, especially cigarettes, should be forbidden. It is possible for a man to smoke a pipe or cigar and succeed in athletics, though he is considerably handicapped; but the boy that cannot go without cigarettes had better keep himself entirely out of athletic sports.

The next factor in training—sleep—is far more important than diet. Too much emphasis, especially in the case of boys, cannot be laid on the necessity of obtaining all the sleep possible. A famous sprinter, who one year utterly disappointed all his friends and his college by failing in most of his races, and who had become overtrained, said to the writer afterward that he attributed his poor showing entirely to the fact that, because of certain extra courses of study, he had not been able to obtain the necessary amount of sleep. Every boy, when in training, should be in bed by ten o'clock and rise at seven. If he is not accustomed to such hours—and most boys, alas! are not—he will probably at first be troubled by not being able to fall asleep at once, or, more commonly, by waking in the morning an hour or so earlier than usual. However, let him persevere in his well-doing, and gradually the ability to put in nine solid hours of good, refreshing sleep will come to him. If the food builds up the muscles, it is sleep that steadies the nerves and gives a boy that feeling of confidence and coolness at critical moments which so often saves a game. Under no circumstances should an athlete do any sleeping in the daytime; it tends to make him logy and listless, and is discouraged by all trainers.

In regard to the kind and amount of exercise necessary in training, that depends too much on the kind of athletics for which a boy is training, and on the boy himself, to admit of much generalization.

In any kind of athletics, however, the greatest care should be taken not to overdo matters at first. As the trainer at Yale used to say, "You can't go too easy the first week." Any overstraining before the body is built up a little may cause a permanent injury. In football, full halves should not be played during the first week; a track athlete should indulge in sundry long, easy jogs; a tennis player should not play more than one or two hard sets a day, and like caution should be observed in all the other branches of athletics. The time of day when the exercise should be taken is really a matter of slight importance. The morning is probably the best

time to train, though nine athletes out of ten do their work in the afternoon, and many noted English athletes take their exercise after dark.

No work harder than a short, brisk walk should be undertaken before breakfast. Five-mile walks and runs in the early morning are, fortunately, things of the past. Before breakfast the fires are banked, so to speak, and no hard physical or mental work should be taken before fresh fuel, in the shape of a hearty meal, be added. A good way to start the day is to drink a pint of fresh, cool water upon rising; this washes out the stomach, stimulates the digestive organs and usually prevents one from feeling thirsty between meals.

It is not common for a boy to become overtrained, or "stale," as it is called, but it may sometimes happen that under the direction of a too enthusiastic captain, or, urged on by his own ambition, he may overwork himself and become overtrained. The symptoms are a general feeling of listlessness, loss of appetite and weight, and inability to sleep. The surest sign is the loss of weight. A boy's weight is the barometer by which he should keep track of his condition, and when in training he should weigh himself stripped, once a day at the same hour. After he gets into good condition his weight should not vary half a pound. If, after he has been in training for some weeks, his weight should suddenly commence to go down, something is the matter, and probably he is overtrained. It is a difficult thing to get an overtrained athlete back into condition again. In the first place, he should stop all work and entirely change his diet. Instead of working on track and field, let him stay at home and eat anything that he wants. The writer remembers one team on which a man became overtrained. The trainer immediately inquired if there was any article of diet that he especially wanted. The overtrained individual reflected for a moment, and finally said simply: "Ice cream!" And during about a week that athletic pet constantly regaled himself on ice cream and ices of the most luxurious description, to the disgust of his healthy team-mates, they being forced to sustain life with a rice pudding as their sole dessert.

Some few days' change of this sort will usually prove sufficient, and the work should of course be made a little lighter for some time after resuming duty.—"St. Nicholas" for June.

NEW ORLEANS.

DRAINAGE AND SEWERAGE.

Uprising of the People for Sanitary Improvement and Their Final Success.

From the *Times-Democrat*, September 1, 1899.

The great work of the past year in New Orleans, the greatest work the city has ever undertaken, was the inauguration of its sewerage, drainage and water system. The necessity of properly draining New Orleans was recognized from the very day the city was founded. It was seen, after a few years' experience, that the lack of drainage and the supersaturated soil from which the town suffered, tended to cause malarial diseases; indeed, the situation was so unpromising that the new city was practically abandoned after its foundation because of the drainage difficulties in its way. But, five years later, Bienville returned and made New Orleans his permanent capital. From that day to this the people have been wrestling with the drainage problem. Millions were spent on drainage, but the various schemes were more or less patch-work, and none were thorough or complete. No proper survey of the city was made (only a casual survey of the swamps in 1856). No general or permanent plan was prepared.

The opinion was very general that the location of New Orleans, the fact that the ground upon which the city is built is flat and below the level of the river, rendered it impossible to ever provide a thorough or complete drainage system, and that the best that could be hoped for was to get rid of the bulk of the excessive rainfall in a comparatively short time. Those who did not take this very pessimistic view, yet realized the immensity of the job, its great difficulty and its cost. It was believed to be beyond the resources of New Orleans, and was indefinitely postponed to the distant future. To get drainage the city would have to become far richer than it had been, and to have in power an administration so commanding the public confidence that the people would rally to its support and furnish the funds needed.

As for sewerage, it was not even dreamed or whispered of in the earlier days, and whenever a visitor called attention to the sewer-

less condition of New Orleans he was met with the replies that sewers would be impossible, if not dangerous, in this climate and soil. Experience has proved the contrary, that sewers are absolutely necessary to any well-regulated city, and have a material effect in reducing the death rate. We have had of late very unpleasant evidence that they are especially necessary in a city like New Orleans, where infectious diseases have prevailed, and where the seeds have been held over in the soil and vaults from year to year, because we lacked a sewer system. The experience of Buenos Ayres, which used the New Orleans vault system until devastated by the fever, was a sufficient warning that we could not follow the old method in vogue without risk and loss. Buenos Ayres made the change and its health improved at once.

But sewerage came after drainage. We began the latter years ago, in the very first days of the colony, when no one thought sewerage possible; but the success lately met with in drainage has encouraged us to undertake these two great improvements at the same time.

Early Drainage Plans.

It is not necessary to go over the history of drainage in New Orleans in the early French and Spanish days. The system followed then was the most primitive possible and very unsatisfactory, and responsible for many of the evils that exist to-day. The streets were bordered with immense ditches, grown up with weeds, and supposed to empty the rainfall into Bayou St. John or the canal back of the city.

In 1857 Mr. Louis H. Pilie, then city surveyor, called attention to the bad drainage of New Orleans and the fact that the city was flooded after every rainfall, and urged some improvement. He recommended the construction of a number of open canals and rear levees to prevent the city from inundation by Lake Pontchartrain. Nothing was said about pumps to lift the water, and many parts of the city were left subject to floods after heavy rains.

Even at that day the importance of drainage to New Orleans was fully recognized, for the report closes as follows:

"When the drainage of our swamps shall be perfected, our city will then rank among the healthiest in the world. The growth and population of the city will rapidly increase, our commerce will be largely benefited, our population, far from seeking a residence elsewhere during the summer and sickly months, will remain in

the city and erect delightful residences along the lake shore and upon the now swamp lands, and thus a large amount of property at present valueless will swell our assessment rolls."

But these suggestions, although excellent, accomplished nothing. The Legislature was constantly passing acts relative to the drainage of New Orleans, but they accomplished no practical good. There were laws of this kind passed in 1858, 1859 and 1861, but nothing of any moment came of them. With the exception of the work by Mr. Bell, city surveyor, between 1871 and 1873, nearly all the money expended up to the time that the present drainage plan was adopted was wasted.

Various schemes were proposed by which the work would be done by private companies. As early as March, 1835, a charter was granted for a period of twenty years to the New Orleans Drainage Company, to drain and reclaim by means of canals and ditches, the land from the suburb Livaudais, and the line of the new canal to Lake Pontchartrain, along the lake to Bayou Cochon, and via Fisherman canal to the Mississippi river.

In 1871 the city was authorized to enter into a contract with the Mississippi and Mexican Ship Canal Company for the construction of levees to protect the city from overflow and of canals and pumping machinery for the drainage of the city. This act authorized a charge of 50 cents per cubic yard for all earth excavated, and the same for all levees built. The work was carried on under the direction of City Surveyor Bell, and is known as the Bell plan. It proposed the delivery of the drainage of the city directly into Lake Pontchartrain, and included the construction of a substantial breakwater and levee along the lake from the Upper Protection Levee to People's avenue canal, at the lower end of the city. Only part of this levee was built, what is now known as the West End revetment. Mr. Bell proposed to pump the rain water over the Metairie Ridge, into canals that would empty it into Lake Pontchartrain. He fully recognized the risk of emptying all the drainage of New Orleans into that lake, and recommended Lake Borgne as the ultimate outflow of the foul drainage of the city, which is a feature of the new drainage system; but Mr. Bell, although he favored the Lake Borgne outlet for drainage, did nothing to carry this idea into effect. It was beyond the resources of the city at the time.

His work simply contemplated carrying off the surplus rain water into Lake Pontchartrain. It was good as far as it went, and

was the first drainage scheme worthy of the name. It did not accomplish, however, half what was needed. It left part of the city undrained altogether. The drainage it provided for was slow, the water standing in many places for days after a heavy rain, and it kept the soil in a constantly supersaturated condition. Injurious to public health, moreover, the canals dug during Mr. Bell's regime were neglected by subsequent administrations, allowed to fill up, so that the old overflows were reverted to.

Apropos of the Bell plan, it may be well to recall what Mr. Bell said as to drainage and sewerage, in a communication to the Administrator of Improvements:

"I suggest that in the location of pumping machinery it be placed with a view to the ultimate division of the city into urban and suburban drainage, the urban drainage to be conveyed by sewers or large iron pipes, below the city into Bayou Bienvenu (which drains into Lake Borgne). The suburban drainage should be emptied into Lake Pontchartrain."

But while the Bell drainage system was an improvement on what had gone before, it was far from satisfactory. Moreover, it was never completed. Only a small portion of the revetment on Lake Pontchartrain, from the New Canal to the Upper Protection Levee, was constructed, and many parts of the city were left unprotected. There were frequent floods of the farms and dairies in the rear of the city, and in 1875 a considerable part of the thickly populated section in the rear of the Second District was under water for several days, and a relief association had to be organized to assist those whose residences were more or less flooded; in some cases to the second story. The losses from these floods, due either to high water in the lake, or to excessive rains and bad drainage, ran up into the tens of thousands, and showed very clearly that something should be done.

For the next twenty-five years the drainage problem was well discussed, in and out the press, and the city government was flooded with scores of plans.

In 1881 Mr. Joseph Jouet proposed a drainage plan—a large central canal which would act as a main tail race for all the drainage. The canal was to run from the Upper Protection Levee, on the Jefferson line, and empty into Bayou Bienvenu, through which all the drainage water of New Orleans would be emptied into Lake Borgne. (The central canal is part of the drainage scheme, finally adopted.)

It is needless to discuss the various other plans proposed, which were more or less modifications of those given and were open to greater or less objections. None of them were adopted and very few ideas were borrowed from them. They are illustrative, however, of the fact that the importance of good drainage was fully recognized and New Orleans was trying to get it, but did not seem to know exactly how to go about it.

What the trouble was became evident in 1890, when the Orleans Levee Board, which had begun the work of at least keeping the city free from lake and river overflow, offered a premium of $2,500 for the best plan of drainage for New Orleans. The board could furnish the contestants no information or data upon which they could base a plan—and could give, indeed, only the general map of the city. There was no exact information as to topography, area, hydrography, or any other data essential for the formulation of a practical and effective plan. A survey of the swamps back of the city had been provided for by the Legislature as early as 1856, and $5,000 voted therefor; but this survey, even if it had been of any use, had long since been lost. When, therefore, the Orleans Levee Board came to examine the several plans for the drainage of New Orleans, it was compelled to reject them, for the reason that there was no reliable data which could tell whether the plans were of practical value or not. Not knowing the amount of the rainfall, it was impossible to know whether the canals provided for in these several plans were sufficient to carry it off; and not knowing the topography of the country, the fall and current of the canals were an absolutely unknown quantity.

A Topographical Survey.

It was seen at once that nothing could be done in the way of the drainage of New Orleans, and no plan adopted until the city had been thoroughly surveyed, and all the data as to rainfall, etc., obtained, necessary to base a drainage system on; in other words, that to do anything practical it would have to begin anew.

The Legislature was appealed to in 1888 in this connection, but did nothing. Mr. Harrod, then city engineer, endeavored to induce the Council to act, but it saw no money in sight to carry out a drainage plan if one was proposed. An appropriation of $17,500 was finally voted for making a thorough survey of New Orleans, that would show its rainfall, the contour of the land and

give whatever other information might be needed in preparing a drainage plan for the city.

The work on the topographical survey was begun July 1, 1893. It was temporarily stopped on September 1, in consequence of that bane of all public improvements in New Orleans—an injunction; but the injunction was dismissed December 15, 1893, and the survey continued until completed. It was not only the most complete plan ever prepared of New Orleans, but really the only one. It became evident that the various schemes for the drainage of New Orleans laid before the Council or the Advisory Drainage Board were valueless, being based on false data; and all of them were thrown overboard at once.

It is impossible, of course, to give even briefly the facts brought out by this survey.

Taking the mean Gulf level at New Orleans, it showed the following levels:

Storm level of Lake Pontchartrain, 3.74 feet above the mean Gulf level.

High water in the Mississippi, 16.34 feet above M. G. level.

The highest point in New Orleans, except, of course, the levee, was the river front extending from Felicity to St. Louis, which was 16 feet above the M. G. level. The land rapidly sloped back with a fall of from 8 to 12 feet to the first mile. St. Charles and Rampart streets represent a line of 5 feet over the M. G. level. The lowest point was reached at Broad street, where the land sank to 1 foot below the M. G. level. The land, however, varied in height, and there were traces of prehistoric crevasses, where the level was below that of the surrounding districts, forming sink holes, as it were, very difficult to drain, and showed why previous plans had been more or less failures.

Back of the city Metairie Ridge rises to about the level of St. Charles and Rampart streets, being 4 feet higher than the swamps between it and the lake. These swamps are just above the mean Gulf level, and 3.74 feet below the storm level of Lake Pontchartrain. It can be readily seen, therefore, that unless they are protected by levees they are likely to go some 3 feet under water in case of a storm in the lake. The same is true of the land inside of Metairie Ridge, along the line of Broad street (the lowest section of the city proper).

The survey showed conclusively why previous drainage plans had been a failure. They were too general, and not specific

enough. The varying levels of New Orleans required every foot of ground in the city to be taken under consideration. The plan of drainage necessary was far more complicated than imagined, and no plan was of value unless the engineer possessed all the data before him. As a consequence the final report of the city engineer, accompanied by a contour map, showing the height of every point in the city, knocked out all the previous schemes for the drainage of the city.

Advisory Board.

On March 30, 1893, an Advisory Board of Engineers had been created, consisting of Messrs. Rudolph Hering of New York, who had great experience in all drainage work; B. M. Harrod, ex-city engineer and member of the Mississippi River Commission, and H. B. Richardson, chief State engineer, which was authorized to consider the plans and survey made by City Engineer Brown, and to approve or disapprove them.

The survey made by the city engineer demonstrated that these plans were faulty and defective and did not provide for the drainage of the entire city. They were therefore rejected, and the city engineer instructed to prepare and recommend a plan of drainage based upon the facts deduced by his survey, and investigation as to the rainfall and other conditions affecting drainage.

On April 29, 1895, the Advisory Drainage Board laid before the Council the results of the survey made, as well as the drainage plan based on these data, which, with a few minor changes, is that now being put into operation, and which will give New Orleans a perfect system of drainage, and get rid of the floods and overflows that have been so frequent in the past, the dampness due to a supersaturated soil, and the disease consequent upon this humidity and malaria.

The Drainage Plan.

The difficulty of drainage in New Orleans consists in the contour of the land, all of which is below the level of the Mississippi river in high water, and much of which is below the level of Lake Pontchartrain during a storm; and in the excessive semi-tropical rains which frequently occur here, and which throw an amount of work on the canals and drains that call for unusually large ones.

The contour of the city required, first of all, its thorough leveeing, to shut out the river and lake floods—this has been provided for by the Orleans Levee Board, which body naturally co-operates

in any plan looking to the drainage of the city, and which body, indeed, has become a part of the official machinery that will carry out the great work—and pumping. The drainage water of New Orleans can be got rid of only by means of pumps. The fall of the land is not sufficient to carry off the water for weeks, unless pumps are used, and in the event of a storm in Lake Pontchartrain the canals are banked up at once.

Rainfall.

Mr. Brown, in making his survey of New Orleans, had not overlooked the important matter of the rainfall. It was necessary to find how much rain fell in order to know the required capacity of the canals and pumping stations.

In a single storm of April 7-8, 1883, as much as 9.22 inches of rain fell; on August 19-20, 1888, 8.9 inches—which would have flooded the lower sections of the best drained town in the world. Since 1871 there have been seventy-six storms in which the rainfall has exceeded 2.5 inches, enough to call for unusual drainage facilities. On August 20, 1888, the rainfall was 3 inches in one hour; and on July 6, 1889, at the rate of 4.2 inches per hour. No plan which did not take these facts into consideration and provide for such an excessive downfall was of any practical value.

It was also necessary to find how much of the water evaporated or ran into cisterns and how much had to be carried off by the drainage systems. The investigation made from April to December, 1894, gave the data, as follows:

	Volume of precipitation, cubic feet.	Volume of discharge, cubic feet.
April	209,727,780	176,811,270
May	114,942,606	111,924,313
June	207,652,192	157,400,551
July	443,258,504	325,739,830
August	377,629,619	306,368,315
September	31,852,150	76,464,129
October	65,048,033	81,500,008
November	56,481,417	76,540,593
December	59,027,641	95,537,415
Total	1,565,619,942	1,408,286,424

It will be seen from these figures that the drainage of New Orleans must provide for practically all the rainfall, and that is very large.

Taking into consideration all these facts which had never before been known to the engineers who had proposed drainage plans for New Orleans, Mr. Brown perfected a plan which he laid before the advisory engineers, the Advisory Drainage Board and the City Council, and which was approved by them.

The plan, in brief, is to drain the city by means of covered and open canals into a central drainage canal along Broad street (the lowest point in the city). The surface drainage is to be emptied by way of this canal and Bayou Bienvenu into Lake Borgne, but the surplus rain water, which is practically pure, is to go via the old open canals into Lake Pontchartrain. The necessary head or fall to enable the Broad street canal to carry off the water it receives is obtained by means of pumping stations a mile or so apart, each of which will raise the water several feet and give the water a good velocity.

The merits of this plan will be seen at once: It gets rid of all the foul or contaminated water into Lake Borgne, whereas the continued emptying of this water into Lake Pontchartrain, as heretofore, would in time make a cesspool of that lake and make it dangerous to the health of New Orleans. At the same time, it provides for getting rid in the shortest possible time of the rainwater in case of an excessive tropical storm—a very difficult problem.

Its purpose is to remove rapidly the rainwater which now runs off into the gutters and floods the streets and finally the low-lying localities, lying in the rear of the city, inflicting considerable damage to property and interfering with travel and the transaction of business; and also to remove the ground water which at present saturates the soil, causing extreme humidity and very unsanitary conditions.

Details of the Plan.

It provides for the drainage of the entire territory likely to be built up.

It has been divided into six sections with details; calls for eight pumping stations, one central and six auxiliary, and the Algiers station; one main canal on Broad street, about 6.5 miles long, various tributary canals and four relief outfalls for use in case of excessive rainfalls.

The main canal, through which the bulk of the drainage will pour, will extend through the entire length of the city, emptying by means of the central pumping station into another canal connecting it with the headwaters of Bayou Bienvenu and thence with Lake Borgne. It is to be 70 feet wide and 15 feet deep. It will remove not only the daily flow of drainage when there is little or no rainfall, but the flood during heavy rains up to its discharging capacity. It will also serve as a basin for the collection of storm water (to the extent of its cubic contents) and until the pumps are started. It will be lined through its entire bed and sides with smooth and permanent material in order to assure cleanliness and a good velocity and discharge. It will be carried under the New Canal and Carondelet Canal by large iron pipes, in such a manner as to avoid a depression and any trouble in its maintenance.

From the main canal on the south the various branch canals, the principal of which are the St. Louis canal (already completed), the Melpomene and Third street canal (contracted for), the Lower line, Nashville avenue, Napoleon avenue, St. Bernard avenue, Lafayette avenue, Louisa and France streets and Jourdan avenue. Running into these branch canals are subsidiary ones like the veins on a leaf, providing a system by which every part of the city will be drained at once. Last in this system comes the gutters, which are to be regraded and lined. They will be of shorter length and of smaller size and discharge than at present. The water will run off at once from them into the drains instead of standing in them as at present.

The drainage of the several sections is effected by branch canals.

Thus every inhabited portion of New Orleans is provided with immediate drainage, the slope of the canal being such as to carry off the water in the shortest possible time. It is estimated that the several canals can carry off 12,904 cubic feet per second.

The canals will thus discharge 46,454,400 cubic feet per hour. The heaviest precipitation that fell between April 1 and December 31, 1894, was on April 24, amounting to 109,572,021 cubic feet. This, allowing for the loss due to absorption by the soil, could have been discharged into the main canal in two hours. Only three times during the nine months from April, 1894, to January, 1895, would the discharge have required more than an hour to get rid of.

To give the main canal sufficient head to enable it to discharge its waters with great velocity, and to get rid of the storm water

(the surplus rain water in the event of heavy rainfall), eight pumping stations are arranged for.

At each of the pumping stations there is an outfall, at which the storm water is lifted to a height of 7 feet above the main level of Lake Pontchartrain, so that it will discharge into the lake.

These, in brief, are the main features of the plan laid before the Advisory Drainage Board, and by it submitted to the Council. While the plan received the cordial approval not only of the consulting engineers, but of all the leading engineers of the country to whom it was submitted, as one meeting in the most thorough and satisfactory manner all the difficulties confronting the problem, there still remained the great problem of cost—$7,933,691. As this was a sum so clearly beyond the reach of New Orleans at the time, the consulting engineers made a separate estimate for the Second Section, which includes nearly all the business district of the city, so that this work might be undertaken which was pressing. While it would not give all New Orleans perfect drainage, it would at least prove a very decided relief and show the advantage of drainage so clearly to them that they might be induced to vote the money necessary to carry through the entire plan. That part of the plan, the drainage of the commercial section of the city, was estimated to cost $1,301,310. It was recommended in the report to the Council that it be begun first.

While the report was received with satisfaction and all agreed that the plan was a splendid one, of the greatest positive benefit to New Orleans, the movement stopped here uncompleted for some little time. The difficulties and troubles in which the outgoing city administration had become involved prevented the drainage plan from being pressed to completion. And the entire question, therefore, went over, but with the popular interest so thoroughly aroused on the matter of drainage, now that it was seen to be practical, that it was quite certain it would never rest until the great work was completed. New Orleans at least had a plan of drainage, even if nothing had been done to carry that plan through to completion.

An ordinance providing that the city engineer should prepare specifications to carry out the drainage work of the Second Section was submitted to the Council in December, 1895, and adopted. These specifications were presented in January, 1896, but not adopted. Then for a short time the entire drainage scheme again languished.

The Drainage Board.

When, however, the Legislature met in May, 1896, it took legislative action which placed the drainage system on a firm foundation by passing the drainage act, creating a new board, giving it additional funds and authorizing it to issue bonds based upon its revenue.

The Drainage Board created by this act consisted of two members of the Board of Liquidation, three members of the Orleans Levee Board, and, ex-officio, the Mayor and the chairmen of the committees on finance, the budget and water and drainage. This board was authorized and directed to proceed with the work of providing a drainage system for New Orleans, using for that purpose the $700,000 derived from the sale of the city railroad franchise and that half of the surplus interest tax set aside for permanent public improvement. It was authorized to issue bonds based on this revenue, so that the drainage work could be pressed forward to completion.

It was September, 1896, however, before this board was organized, with Mr. B. M. Harrod as chief engineer.

Two months afterward, in November, 1896, the board instructed Mr. Harrod to at once prepare a plan of *drainage,* and specifications for such work as might be needed, it having been decided to at once begin work in the commercial section of the city, so as to show the people what drainage meant.

This work began in 1898. A great many difficulties were encountered at first. The water-sogged condition of the soil made it hard to handle, and the presence of quicksands proved a great nuisance. Moreover, the tendency of the land to sink as the canals were constructed, due to the water being squeezed out of it, caused the sidewalks to crack, and even endangered the neighboring buildings. All these difficulties were overcome in time, however. The contractor drove piles ahead of the work, and this prevented the sinking of the soil. The machinery in use, the scooper and excavators, were improved to meet local conditions, and the force at work became more efficient as progress was made. This force was very large, amounting at one time to 1,420 men, who, under the terms of the contract, were required to be bona fide residents of New Orleans.

As the work progressed it was done more expeditiously and more cheaply. It became at once apparent that the cost of estab-

lishing a drainage system for New Orleans would fall far below the original estimate. Another still more important result of the excavations for drainage was to revive the project of sewering New Orleans, by showing that the cost would be far less than had been estimated. A private company had undertaken the work of constructing a sewerage plant, but had encountered such serious difficulties and had found the work so expensive that it had thrown up the job and abandoned the work.

It was now found that under different methods adopted the necessary sewers could be laid, and the result was to bring about an agitation in favor of sewerage as well as drainage, which finally culminated in the passage of the water, sewerage and drainage law, and the imposition, by a vote of the people, of the necessary tax to carry through the work.

But to return to the drainage. The first contract, which included the St. Louis and Basin streets canals, was so satisfactorily done that the Drainage Board authorized the contractors, as it was entitled to do, to continue the system by the construction of other canals. On July 5, 1899, a second contract was awarded.

Thus there has been completed, or is now under contract, work that will drain three of the seven districts of the city.

Much of it is already completed, and there is hope to put in operation a portion of the drainage system of the city this month (September). In fact it may be said that the actual operation of the drainage system of New Orleans will begin in part in a few days, and that, from this time forward until completed, the area drained will be extended from day to day until the drainage of the entire city is provided for.

Heretofore drainage has been into Lake Pontchartrain. The Drainage Board, however, sees how inadvisable it would be to adopt this system as a permanency, for with the growth of population it would tend to make the lake in time a cesspool. This system will, accordingly, be abandoned in a very short time, as soon as the Broad street canal is completed.

SEWERAGE.

The sewerage system of New Orleans has not yet been even touched, but its practicability has been proved, and the necessary money voted for it, and it is now simply a question of negotiating the bonds and doing the work. The sewerage plan is the fruit of

the drainage work. It has long been desired, for New Orleans had fully recognized the importance of sewers. The city's health had suffered for lack of them, and it was seen that sooner or later we must have them, like every other American city, or drop behind in the race for commercial supremacy.

The difficulties were considerable, much the same as those of drainage—the flatness of the city, and getting rid of the sewage. The latter must be deposited in a running stream that will carry it off; it cannot be pumped into Lake Pontchartrain, or even Lake Borgne, as the drainage can be disposed of. This at once doubled the difficulty and the cost, for it required a sewerage system entirely different from the drainage system of the city. Whereas, in New York and other cities the two systems are identical, the cost of construction is consequently very materially lessened, and the rain water plays an important part in keeping the sewers properly flushed and clean. Here the sewerage must be entirely distinct and separate from the drainage, thus requiring a double system of pipes and drains. The peculiar condition of New Orleans in this matter is perhaps best illustrated by stating that the ordinary drainage of the city is to empty into Lake Borgne by one system of canals; the storm water, or excessive rain, falls into Lake Pontchartrain, by a second system of canals, and the sewage into the Mississippi by a third system of drains and pipes.

In spite of these difficulties, it was unanimously agreed that New Orleans must have sewerage. The Louisiana State Board of Health had on more than one occasion declared our vault system thoroughly bad and unsanitary. Moreover, it had been shown at Memphis, where the difficulties were somewhat similar to these in New Orleans, that they could be overcome by the Waring system; and also that sewers got rid of the fever and other diseases. No city had ever been brought nearer to municipal death than Memphis after its epidemics of 1878 and 1879. From the complete collapse then threatened Memphis had escaped by the construction of a sewer system, and it was felt that New Orleans could surely do what Memphis had done.

A Private Sewerage Company.

But as there was no money in sight at the time, it was resolved to imitate the example of Memphis, whose first sewerage system had been constructed by a private company. The City Council

accordingly granted a franchise to a private company to lay the necessary pipes and drains; and an arrangement was made whereby the New Orleans Waterworks Company would furnish the necessary water to householders at a fixed price, and would also extend its mains so as to bring the greater part of the city under the operation of this new sewerage system.

Work was begun on an extensive and expensive scale, and the new sewerage company at once encountered the most serious difficulties. The company failed to carry out its contract and the work was suspended.

The failure of the private sewerage company to carry out its contract did not prove a set-back to the demands of the people of New Orleans for a sewerage system; on the contrary, it gave a stimulus to the movement, and assured municipal as opposed to private ownership. Several circumstances tended to stimulate the movement; first, the appearance of fever in New Orleans in the fall of 1897, which called attention to the bad sanitary condition of the city; and, secondly, the work done by the National Contracting Company in the drainage.

In the fall of 1898 the movement got fresh impetus. It was natural that the matter of public improvement should be discussed, especially those of a sanitary character.

The whole subject matter was referred to a special Council committee on sewerage for investigation and report.

It was pending the action of the committee that Mr. Brittin suggested the plan that is the base of the present sewerage, drainage and water ordinance providing for a 2 1-2-mill tax to cover the cost.

After consulting with the city attorney it was found necessary to submit the question of this tax to a vote of the taxpayers. It was not, however, until June 6 that the question was voted on, and when the tax was carried by an overwhelming majority of both the taxpayers and property. The taxpayers also voted by a large majority in favor of the appointment by Mayor Flower of the seven Sewerage and Drainage Commissioners provided for by the ordinance.

To carry out this ordinance an act was passed by the Louisiana Legislature, in extra session, August 18, providing for the appointment of the Sewerage and Drainage Commissioners by the Mayor, the levying of a tax of 2 1-2 mills for forty-two years, and also submitting to the popular vote the question of the issuance of

bonds by the City of New Orleans based on this tax. This bond matter will therefore be disposed of at the State election in April, 1900. In the meantime the Water, Sewerage and Drainage Board will have thoroughly organized and be ready for work; so that the issue of bonds can be made as soon as the amendment to the Constitution is approved by the popular vote. That issue will be $14,000,000 or more, the amount being dependent on the rate of the interest of the bonds.

Status of Sewerage.

This is the status of the sewerage movement to-day. Nothing can be done until after the State election in April next, not even the survey of the city made that will be necessary to establish the sewers, mains, etc., but the preliminary work will be so well done by that time that the commission will be able to open the bids and go to work the moment the amendment is adopted by popular vote. The sewerage system will be well under way by this time next year.

Exactly how long it will take to complete the sewerage, drainage and water systems of New Orleans cannot now be told, but it ought not to be more than three or four years. Now that we understand how the work is to be done, it can proceed rapidly.

The mortuary records of neighboring parishes similarly situated to New Orleans in other respects indicate that the death and sick rates of the city can be reduced from 24 to 26 per 1,000 per annum with drainage and sewerage and a good water supply. Sanitary improvements will relieve New Orleans of the serious injury it now suffers from in consequence of quarantines, will give a stimulus to many kinds of business, and will make the city one of the richest and most prosperous in the Union, which its situation destined it to be, if it had not been held back by unsanitary conditions and disease.

ERA OF PRACTICAL SANITATION.

"After the lapse of twenty years," the stamping out of yellow fever in, and the prevention of the spread of yellow fever from, New Orleans in 1879, is designated by President SOUCHON, of the Louisiana State Board of Health ("New Orleans Medical and Surgical Journal, September, 1899), as "a banner year, an epoch-

making year," in practical measures for the prevention of yellow fever. "It is (was) the dawn of the era of disinfection—i. e., of scientific sanitation," which, coupled with the scientific quarantine methods initiated by Dr. Joseph Holt five years later, "have finally culminated in the brilliant work of to-day at the Mississippi Quarantine Station, in the splendid achievements of the U. S. Marine Hospital Service under the Atlanta regulations, and in the marvelous and comforting result, in 1897, of the Isolation Hospital, Touro Infirmary and Hotel Dieu, in the thorough controlling of the spread of the disease by unrelenting, vigilant disinfection—i. e., the destruction of the germs as fast as they leave the patients through their secretions and excretions. The results at the Touro, where no case originated, were particularly striking. There, Dr. Loeber states over his signature that he did not even isolate the cases. He placed them in the wards among other patients, but he was particularly watchful of disinfection. He did not allow the students and the nurses to go into the city as long as the epidemic lasted, as they might contract the disease and bring it into the place."

Referring again to the work of 1879, and quoting the report of the Louisiana State Board of Health for that year—

"Yellow fever was arrested, if not immediately destroyed, in its very commencement, by cleanliness conjoined with disinfection. . . . The quarantine measures were executed by the National Board of Health, the State Board of Health co-operating. . . . The measures were the establishment of sanitary inspection for freight and passengers on railroads and river crafts.

"It is entirely proper to assert, in the light of what has since occurred, that the circulars of the State Boards of Health of Mississippi and Tennessee averted a panic, prevented the interruption of travel and traffic, and restored confidence throughout the Valley of the Mississippi in many communities, which have not yet forgotten the history of the year 1878. (See Report 26, National Board of Health, 1880, pages 59, 60.)"

The measures referred to (National Board of Health Bulletin, Vol. 1, page 120) were instituted by the Inspector of the National Board of Health, then on duty in New Orleans, to carry out the rules and regulations recommended by that board to be observed at the places of departure when yellow fever exists there or in the vicinity, and were as follows:

"Inspectors of steamboats and other vessels will carefully examine and report upon the condition of—

"All bedding and bedclothes of whatever kind; that which presents any evidence of impurity should be prohibited. Stale feather or hair mattresses, bolsters and pillows, should be prohibited or required to be renovated by high heat. Wire mattresses, bolsters, and pillows should be recommended in place of all other material. All cotton comforters and soiled clothing not washable in boiling water should be prohibited. Woolen carpets, rugs, and curtains should be prohibited. They may be substituted by matting or by material washable in boiling water. Any decayed wood in the decks or floors should be looked for and required to be replaced by sound wood forthwith, or be left exposed without covering of any kind, and required to be saturated daily with a boiling hot solution of copperas—one pound of copperas to the pailful of boiling water.

"Upholstered furniture of all kinds should be advised against, and any which presents evidence of retained dirt or of long use prohibited. Cane, or other material not liable to hold dust and dirt, should be recommended in place of all upholstered furniture. All kitchen, pantry, or other decks or floors subject to frequent wettings and dampness should receive a last washing daily with hot copperas water. All storerooms and closets should be looked into, and the stowing away of damp or soiled clothing therein prohibited. Waterclosets and urinals should be scrupulously clean and odorless.

"The hold and bilge of all steamboats and other vessels should be examined with special care, and whenever any bilge-water or offensive odor is present cleansing should be required by pouring in and pumping out water, by the use of the syphon pipes for conveying steam at as high a heat as practicable under the dunnage, and by the use of copperas until all foul odor is removed. Merely damp holds and bilges should be sprinkled with copperas to prevent mustiness.

"Barges should be examined with the same care as steamboats. Whenever there is evidence of bilge-water or dirt in the bilge, which may be detected by the pump-water or at the ends of the flooring (the dunnage) fore and aft, the dunnage next to and longitudinal with the keelson should be removed and thorough cleansing required in the manner already described for steamboats. The open spaces at the ends of the dunnage and the bot-

toms of the scuppers and ventilators communicating with the bilge should be kept sprinkled with copperas."

It was by the exercise of these regulations in New Orleans that not a single case of yellow fever was propagated from the city, and that within four weeks from the time they were instituted the disease was not only stamped out, but all of the quarantines on the Mississippi and its tributaries against New Orleans were raised. And, on the conclusion of the service, all of the leading merchants and steamboat companies of New Orleans and the other river cities petitioned the National Board of Health for the perpetuation of the service. A. N. BELL.

TRAVELING ALONE IN AMERICA SIXTY YEARS AGO.

Apropos to an old proverb that persons who travel alone in strange countries should not write books, is the following extract from a serial by a "Lady," describing a visit to America, in a London newspaper, soon after her return home, in 183—:

"I was a dinin' haboard a first-class steamboat on the Hoeigho river. The gentleman next me, on my right, was a Southerner, and the gentleman on my left was a Northerner. Well, they gets into a kind of discussion on the habbolition question, when some 'igh words hariz. 'Please to retract, sir,' said the Southerner. 'Won't do it,' said the Northerner. 'Pray, ma'am,' said the Southerner, 'will you 'ave the goodness to lean back in your chair?' 'With the greatest pleasure,' said I, not knowin' what was a-comin'. When what does my gentleman do but whips out an 'oss pistil as long as my harm, and shoots my left 'and neighbor dead! But that wasn't hall! for the bullet, comin' out of the left temple, wounded a lady in the side. She huttered an 'orrifick scream. "Pon my word, ma'am,' said the Southerner, 'you needn't make so much noise about it, for I did it by a mistake.'" "And was justice done the murderer?" asked a horrified listener. "Hinstantly, dear madam," answered Miss L——. "The cabin passengers set right to work, and lynched him. They 'ung 'im in the lamp chains right hover the dinin' table, and then finished the dessert. But for my part, it quite spoiled my happetite."

ALBANY'S WATER SUPPLY, AND THAT OF HER NEIGHBORS.*

By James D. Featherstonhaugh, M. D., Cohoes, N. Y.

The questions of water supply, river pollution and sewerage are so bound together that a consideration of one, in most instances, involves a determination of the others. Urban populations, for the most part, are dependent in great measure upon streams or rivers for their water supply, and, having made use of their waters for domestic or physiological purposes, return the waste by means of gravity to their original sources. Thus with the increasing growth of cities pollution of the streams upon which they are built advances *pari passu.*

In the early history of the State of New York, before the Erie Canal, and before the building of the great railroad of the State through the depression of the central and eastern watersheds, when the density of population was less, when the large cities of the Mohawk and Hudson River valleys were but small towns, or insignificant hamlets, river pollution was a negligible quantity and indeed unthought of. Fifty years of growth have seen the census of the State more than double itself, and with this have sprung up towns and villages unknown to the fathers. To-day a population of nearly three hundred thousand souls lives in towns upon the Mohawk and its tributaries. Nearly all of them pour their crude sewage into the stream above us. Under such circumstances, it is not singular that there should be serious sanitary objections to its use for municipal purposes.

The older civilizations across the Atlantic, under like conditions, forced by a greater density of population, and by the greater pollution of their streams, have either protected their watershed, filtered their water supply or treated their sewage before returning it to the source of supply.

In the United States very little has been done to protect populations from the effects of river pollution. Thus in the last census the whole population protected by sand filters amounted only to one hundred and forty-two thousand, and it is believed that the population of cities in which either filtration or precipitation of sewage is performed is yet smaller.

*Read before the Albany County Medical Society, January 25, 1899.

The evidences of river pollution are always to be found in the reports of the State—a record of our sanitary condition and a measure of our civilization.

It cannot be too well understood by us, that there are certain preventable diseases which are mainly water-borne, and that certain conditions in the water supply being fulfilled, these diseases must from the nature of things exist.

Many diarrhœal diseases, the cholera, typhoid fever, are conspicuous and well-known instances of diseases which are water-borne.

It has long ago been recognized that a disease we are very familiar with in this connection—typhoid fever—is dependent upon a specific cause—the typhoid bacillus—which, whether in the soil, the vault, the sewer, the milk we drink or the water we quaff, retains its vitality, multiplies and develops, and brought to us by the great universal menstruum is passed on in its endless chain. One of the duties of the State is a proper consideration of the public health. The municipalities, however, owing to their more concrete form, have yet a greater interest in such matters, and have been foremost in putting into practical use the old saying, "Public health is public wealth." The past ten years have, moreover, been an era of sanitation. It has vivified the art of surgery, has inspired medicine, and even stirred up the smaller municipalities.

Here, where two mighty rivers meet and where a population of nearly a quarter of a million souls lives within a radius of ten miles—some day to be fused under one municipal government—here, also, the tendency of the day is plain; and sanitary changes have been put in effect.

In almost all of these contiguous cities the first steps in our modern civilization have been taken. Improved systems of sewerage coming first, then modern pavements of asphalt or vitrified brick and better water supply, although crude sewage is still turned into the streams. It is worth while, perhaps, to inquire what is the water supply of the various cities and villages which cluster around the head of tide water in the Hudson river. Albany, which is the lowest upon the Hudson, has a population of about 98,000. It has been almost wholly supplied by water pumped from the Hudson river, the intake being probably contaminated by its own sewage. The conditions here having been favorable for serious pollution at the intake, we should expect to

find a high typhoid rate. The rate has been about 9.04 deaths for 10,000 living. The necessity for a purer water supply has been felt there for some time, and endeavors toward that end have been made.

Troy, a few miles above, has a population of about 67,000. It is supplied in a great measure by surface water impounded on the hills above; some water, however, is pumped from the Hudson river. The typhoid rate for five years has been about 4.9, its lower rate probably due to purer water supply.

Watervliet, with a population of about 15,000, draws its water supply from the Mohawk river a few miles above Cohoes. The number of deaths from typhoid during the last two years has been 32, which equals about 10 per each 10,000 living.

Cohoes has an estimated population of 23,000. The water supply is pumped to three reservoirs from the Mohawk at a point considerably above the town. Sedimentation occurs to a considerable degree in the river above the dam for a distance of several miles.

The deaths from typhoid for ten years have been from 9 to 42, an average of 19.2 a year, or a rate of about 8.6 per 10,000 living, and a maximum of 18 per 10,000 living in the year 1891.

Lansingburgh, with a population of about 10,000, has its water supply in the hills above it. The typhoid rate during the past five years has been about 5 per 10,000 living.

Waterford, which takes its water supply from the Hudson above the sewage outfall of any of these cities, has a population of about 5,000, and its typhoid rate has been during the past five years about 6 per 10,000 living.

Green Island's rate has been about the same as that of Waterford.

Bearing in mind that the death rate of the whole State of New York for typhoid is only about 2.5 per 10,000 living, and that density of population does not affect this rate *per se*, since in the maritime district of the State, with an urban percentage in population of 90, the rate from typhoid is only 1.7, and remembering that the immense city of London has a typhoid death rate of only 1.4, it must be conceded that our sanitary showing is a bad one.

Let us, however, compare these rates with those of some towns in which natural sand filtration has been used, and I will take for comparison the three cities nearest to us employing such means for filtration.

The city of Hudson, below Albany, takes its water supply from

the Hudson river. It uses the natural sand filtration system. Notwithstanding that the river at this point is comparatively more polluted than the Hudson or Mohawk at Albany or Cohoes, since a full half million people sewer above it, the death rate has been for many years about 2.2 per 10,000 living.

The oft-quoted case of Lawrence, Mass., which is an admirable instance of water purification, will bear retelling. Lawrence takes its water supply from the Merrimac river, which drains a large region into which an urban population of 300,000 pours its sewage. From 1887 to 1892 the average death rate from typhoid was 11.9 per 10,000 living. In 1893 one of the best constructed sand filters in the country was built, and for the years 1894, 1895 and 1896 the death rate from typhoid was, respectively, 4.7, 3.1 and 1.9 per 10,000 living.

The city of Schenectady, eighteen miles above us on the Mohawk, a city of about 23,000 inhabitants, took its water supply from the river a short distance above its sewage outfall. There was no doubt but that the sewage found its way to the intake. For many years the number of deaths from typhoid was large. The returns for the years 1892, 1893, 1894, 1895 and 1896 were as follows: 50, 21, 11, 14 and 24. Assuming the population to be 23,000, the rate per year per 10,000 living would be 10.4. In 1896 a system of filter wells was excavated in the sand near the river, and in February, 1897, the filter service began. The number of deaths during that year was six, which is a rate of 2.6.

To make the comparison simpler and plainer, let us add together the death rates from typhoid of the three cities of Albany, Cohoes and Watervliet, and, striking an average, compare it with the post filtration death rates of Lawrence, Schenectady and Hudson treated in a similar manner. The figures resulting for the first series are 9.2, and for the second series 2.6. If these figures are correct, and they are taken from the returns of the various registrars of vital statistics, they show two things: First, that where the conditions are tolerably similar the typhoid death rate is closely alike, being high in the cities which pump directly from the Mohawk and Hudson rivers, and low in those cities which filter the water before it is delivered. Secondly, they show the influence of filtration in lowering the typhoid rate. Should there be any doubt in this matter, a glance at the list of cities with their typhoid death rate, so carefully prepared by Mr. John W. Hill, C. E., and read by him in a paper entitled "The Water Supply of

Cities," cannot fail to strike any observer with the overwhelming influence that proper purification of the water supply has upon the typhoid rate, and it will be observed that the best results are obtained when the use of natural filter beds for the water supply are conjoined with the treatment of sewage.

It has been said that no river is long enough to purify itself, and it certainly is true in this sense, that wherever a river is polluted grossly by sewage from the cities along its course, each city like a relay upon a telegraph line, takes in the cause of contagion, and reproducing it in the human laboratory of its population, turns a fresh infection through its sewers into the stream. In the epidemic of '90, '91, this was very evident. The crest of that typhoid epidemic in the various cities on the Mohawk and Hudson had a movement in time not synchronous with the movement of the water. At each city in its descent there was a period of arrest in which the cycle of incubation in the human economy, the discharge into the sewers, and the return to the river took place, and a study of the epidemic in the cities of Amsterdam, Schenectady, Watervliet and Cohoes will show that the periods of the height of the epidemic for these various cities had a sequence in time which was related, not to the movement of the river, but to this cycle. It is this factor of reproduction which ever remains the source of danger, and which renders impossible natural methods of river purification.

Many of these cities have, after much agitation of the subject, become alive to the grave importance of the question of a purer water supply.

Schenectady has, as before stated, abandoned its mode of water supply and is now using the water of the Mohawk river filtered through the natural sand beds of the river.

Albany, after some experiments, is now constructing large sedimentation beds and an extensive system of natural filtration for the waters of the Hudson river, which will cost in the neighborhood of a half million dollars.

Troy is gradually extending its water supply in the Brunswick hills and is depending less and less upon its supply from the Hudson.

The Water Commissioners of Watervliet, at a meeting held in December, voted unanimously to abandon the present supply from the Mohawk for a supply from the hills above them.

Lansingburgh has had introduced a bill in the present Legislature granting the city increased facilities for impounding or col-

lecting water from the streams upon the watershed of Mount Rafinesque.

Cohoes and Waterford still patiently drink their sewage without complaint.

While the most efficient remedy for the pollution of rivers is evidently its prevention, this prevention is not by any means a simple problem, and although the tendency of the best European practice has been toward the purification of sewage before it is turned into the rivers, it is possible, and this is a question for the expert sanitary engineer, that under the conditions obtaining among us, the State has done wisely in refraining from any general acts looking toward river pollution.

From the purely economic aspect, the treatment of sewage upon these rivers would be a formidable affair. The great majority of the cities use the combined system of sewerage, in which all storm water is carried, and if the water supply should be as generous generally as it is in the only two cities of which I have records, viz., Albany and Cohoes, in which 150 and 180 gallons, respectively, are consumed daily by each inhabitant, the taxpayers would revolt at such a prospect of bankruptcy. As, however, both economy and efficiency are obtained by the method of slow sand filtration, and as such waters are generally reckoned as next in purity to high mountain springs, it will be seen that the tendency to abandon the use of the polluted waters of the Hudson and Mohawk rivers, and to establish a different supply, and more particularly to establish municipal filtration of river water, is justified by economics as well as by prudence.—"Albany Medical Annals," August, 1899.

GARBAGE CREMATION, recently provided for, adds additional interest to the long delayed sanitary requirements of Albany. At a meeting of the Board of Health, Sept. 1, F. C. Curtis, chairman of the committee on garbage disposal, reported on several processes and the choice of the *Dixon Sanitary Cremator.* "This crematory," the committee reports, "has stood the test for a long time and in a large number of places. It is being more generally adopted than any other, among them we are informed by three of the boroughs of New York City; it has also been adopted by the United States Government. It meets better than any other the requirements of sanitation and economy and we recommend it for adoption for the use of Albany."

WEEDS IN CITIES AND TOWNS.

By LYSTER H. DEWEY, Assistant Botanist.

In all cities and villages there are vacant lots awaiting purchasers, and in many agricultural districts the unused land in towns often exceeds in proportion the unused land in the surrounding farms. These vacant lots are held in expectation that they will be used some time for building sites, and their value depends on their situation and adaptability for this purpose. Until buildings are erected upon them they are usually given up to whatever will grow. While unused land in the country is generally covered with native vegetation, chiefly perennial grasses and timber, that in cities and towns has usually at some time been under cultivation, so that the native vegetation has been destroyed, and its situation is such that it is most readily seeded with migratory weeds. The seeds are introduced in the packing of crockery, the sweepings from stores, rubbish from yards, cleanings from stables and stock cars, and in various kinds of garbage and refuse, too commonly deposited on vacant lots. Sometimes lot owners encourage the dumping of all kinds of material on their land to bring it up to the grade of adjacent streets, and when the desired grade is obtained the made ground, full of weed seeds, is left untouched. The conditions for weed production have been most admirably prepared, and the natural result is a plentiful crop of weeds.

There is no direct pecuniary incentive to destroy the weeds, since no crops are injured by their presence. In fixing the value of a residence site the distant view of mountain, lake or river is an item of considerable importance, but a weed patch across the street or on the next lot is too often not taken into account.

Characteristics of City Weeds.

The weeds of cities and villages are usually of the migratory class, cosmopolitan in character, and capable of thriving under a wide range of environment. According to the early European works on botany, plants from Asia, adventive in Europe, usually appeared first in cities. Many of these plants are now found about

the cities and towns of this country. Others are native plants which have withstood the changed conditions due to cultivation and have acquired a weed-like habit. In Eastern cities and in those on the Pacific coast Old World species predominate, while in the cities of the interior, especially in those west of the Mississippi River, there is a larger proportion of native plants. The species vary in different cities, in different years, and in different seasons.

In Washington, D. C., the wild onion of winter and early spring is followed by the dandelion and bulbous buttercup; then come the wild carrot, prickly lettuce, and sweet clover, and these in turn are partly displaced in the fall by horseweed, ragweed, cocklebur, Mexican tea, slender pigweed, and jimson weed. Chicory, horse-nettle, burdock, and gum succory are in abundant evidence throughout the season. Some of the most prominent weeds in Boston are burdock, rough pigweed, chicory, and fall dandelion. In Chicago, rough pigweed, tall ragweed and cocklebur are abundant, while there are hundreds of acres within the city limits covered almost completely with Canada thistle, and in several places Russian thistle is rapidly increasing. In Denver, false ragweed, squirrel-tail grass, and Russian thistle are among the most noticeable weeds, and in San Jose, Cal., the vacant lots are chiefly occupied by wild licorice, spiny cocklebur, wild heliotrope, milk thistle, and tarweeds. In Atlanta, Augusta, Auburn, Mobile, and most of the cities of the Gulf States, the weed that is by far the most injurious and the most prominent after midsummer is fine-leaved sneezeweed, a very bitter, yellow-flowered composite, which has been introduced during the past fifty years from west of the Mississippi.

Among the most noticeable introductions in cities during the past ten years are galinsoga in several cities of the Northeastern States; Russian thistle, spreading eastward in cities from Michigan to Massachusetts; buffalo bur, also migrating eastward; wild carrot, migrating westward; false ragweed, in the valleys of the Missouri and Upper Mississippi, and prickly lettuce in all parts of the country.

All methods of seed dispersion are represented in city weeds, but those weeds having seeds adapted for distribution by wind or by burs are most abundant. In the vacant land about woolen mills bur-bearing weeds are especially abundant, while in the vicinity of grain elevators those weeds abound whose seeds are frequently found in grain.

Some Good Effects of Weeds.

The presence of weeds on vacant city lots is not quite an unmixed evil. While young and growing they are certainly more pleasing to the eye than the bare ground or the more unsightly rubbish which they conceal. Some species, such as ox-eye daisy, wild carrot or "Queen Anne's lace," and the wild asters, have very pretty flowers that would be considered beautiful if they did not grow on common weeds. The pokeweed, with its bright red stems, variegated foliage, and shining purple-black berries, gives a touch of brilliant autumn color; and poison ivy, which is too often retained in parks for the beautiful effect of its foliage in autumn, decorates as well many walls and fences about neglected vacant lots.

The weeds growing within easy reach of pupils and teachers in city schools furnish some material for botanical studies, though this source of material does not seem to arouse botanical enthusiasm like a ramble in the woods.

Birds find in weed seeds a considerable portion of their food supply, and sometimes make their nests in the larger weeds; but cockleburs, burdock, thistles, ragweeds, and other coarse species might well be replaced by seed-bearing grasses and clovers, which are better liked by seed-eating birds.

Asters, sweet clovers, thistles, and some other weeds, when in flower, furnish honey bees with nectar, but if the coarse weeds were cut there would doubtless be plenty of honey-producing plants left for the few bees which are kept in cities and villages.

Growing weeds, like other plants, purify the air, and herein lies the chief benefit conferred by their presence in cities, where numerous fires in dwellings, factories and locomotives, and the breathing of the people continually rob the air of its oxygen and charge it with carbonic-acid gas. Growing plants, weeds as well as others, reverse this process. They withdraw from the air carbonic-acid gas and sometimes other injurious gases, and give off oxygen, thus tending to purify the air and keep it supplied with the most essential element. A vacant lot covered with healthy growing weeds is better for the public health and is certainly more pleasing to the eye than the bare ground.

Some Bad Effects of Weeds.

The injuries resulting from the presence of weeds outweigh

many times all the good that can be ascribed to them. They harbor injurious insects and fungous and bacterial diseases of cultivated plants. Many insects injurious to garden and field crops also live on weeds, upon which they thrive and multiply, and thus keep up their numbers, ready to attack their favorite cultivated crop as soon as it is left unprotected. The control of insect enemies and fungous and bacterial diseases of field and garden crops is rendered much more difficult and their extermination, in some instances, is made practically impossible, because they exist on weeds that are not subject to the care bestowed on cultivated crops.

While weeds are growing they aid in purifying the air, but when growth stops and they begin to decay their effect is just the opposite. They then absorb oxygen and give off carbonic-acid gas. A mass of rank vegetation decaying on vacant lots, such as is often seen even in the finest residence sections of large cities, can not be otherwise than unhealthful. Growing weeds also absorb and evaporate the surplus moisture from the soil, but when dead, absorption ceases and they shade the soil from the purifying and drying effects of sun and wind, and keep it damp and sour, a fit breeding place for malaria.

Some of the most abundant and widely distributed species, as the ragweeds, produce immense quantities of pollen, which is extremely irritating to persons afflicted with hay fever and asthma.

Several species of weeds produce very disagreeable odors, as the mayweed, stinkweed, and tarweed. Residents of Eastern cities complain bitterly of the flavor of garlic in the milk delivered to them, yet they allow the garlic to grow so abundantly in their own yards that the odor fills all the houses in the vicinity when the lawns are mowed.

Plants that are dangerously poisonous are found in a large number of the cities and villages throughout the country. Henbane or deadly nightshade is found in a few localities. Jimson weed and purple thorn apple are common in most cities east of the Mississippi River. Their seeds, which are somewhat attractive, are very poisonous, and children fall victims to them every year. Nine cases of poisoning from this source were reported to the Department of Agriculture in 1897. Pokeweed, the root and seeds of which contain a virulent poison, is abundant in most of our cities. Poison ivy in the North, low poison ivy in the South, and poison oak on the Pacific coast, although not strictly weeds, deserve mention among the dangerous plants which are frequently allowed to grow in cities and villages.

There is usually very little space for children's playgrounds in cities, and often the open places that might be used for such purposes, including the occasional vacant lots in sections where land is valued at from $10 to $50 per square foot, are covered with coarse weeds and poisonous plants. In Washington, D. C., a vacant lot three blocks from the White House was covered during the summer of 1898 with a luxuriant growth of burdocks, even the signboard being hidden by the weeds. Opposite a million-dollar mansion, in the same city, is a vacant lot, which, for five years, has been given up almost exclusively to Canada thistle, chicory and ragweed. This weed patch, which would be a disgrace even in the back fields of a careless farmer, is practically all that can be seen, save the backs of houses, from the front windows of the mansion. Close by, in striking contrast with this neglected lot, is a beautiful public park with carefully trimmed green lawn and well-kept shrubbery. These two extremes are found in close proximity in many of our large cities, and from these must the children draw their daily lessons of nature. In one she is ugly and repellant with thistles and burs, and in the other she is too fine to be touched. In less valuable sections of the cities the children keep down weeds on parts of vacant lots by their constant tramping.

Weed patches may be places of interest for the amateur botanist who watches the coming and going of the different species and notes the various adaptations of plants to city life, but for the majority of city dwellers they ruin what little taste may be left for the beautiful in nature.

State weed laws are rendered ineffective by the unchecked production of weeds in cities. The Canada-thistle law in Illinois is probably better enforced in the country districts of that State than are the weed laws in any other section of the country, and the thistle could be easily kept in control there were it not allowed to grow undisturbed in Chicago and other large cities, whence the seeds are carried by wind and railway cars to infest new areas. In many of the smaller villages the State weed laws are well enforced, or the weeds are kept down because of local pride in neatness, without recourse to the law, but this is seldom true in the larger cities.

Injurious migratory weeds are usually first introduced into cities and spread from them to the farms. There are a dozen chances for the original introduction of a weed in cities to one upon the farm. Fine-leaved sneezeweed first appeared about

cities in the South, and is now spreading to the grazing lands and cotton fields. The Canada thistle in its progress across the continent has been distributed by railways, first to the cities. Prickly lettuce has usually been first observed in cities and towns in its remarkable spread over the country. The Russian thistle, indeed, was first introduced into the United States on a farm, but being taken to the cities, it now most frequently spreads from them to the farms. In many instances these introduced species could have been easily destroyed upon their first appearance in the cities and towns, and millions of dollars damage to the farmers thus averted.

Suggestions for Improvement.

A vacant lot unused and given up to the growth of weeds is of very little benefit to any one, and is, furthermore, a source of danger if not of certain injury to the community. The public welfare demands that all elements dangerous to life or health be removed. This would require the extermination of the jimson weed, pokeweed, and other poisonous plants. It would also require the removal or destruction by fire of all masses of coarse weeds as soon as they stop growing. These requirements are sometimes secured by the regulations of health officers.

Something beyond mere sanitation should be demanded, however. A vacant lot should be made to yield its highest possible value in use to the people. There will then be greater incentive to keep it free from weeds. The vacancy of a lot, even though regarded as only a temporary condition, should not prevent it from being put to good use until needed for building purposes. In the crowded portions of cities its best possible use is doubtless to form a playground for children. These need not be elaborately fitted up with costly apparatus like the modern playgrounds in the parks. They need only to have the weeds removed and the surface made reasonably level, cleared of rubbish, and seeded to some hardy perennial grass. Many lots, long vacant, will be already partly covered with turf-forming grasses, and will require only the removal of the weeds, when the grasses already established will spread over the entire surface. Other lots having nothing but a growth of ragweeds and cockleburs will have to be plowed, harrowed and seeded to grasses. Recently graded lots, or those with sterile soil, will not at first support a good growth of grass, but white melilot, the "white sweet clover" so common on waste land,

may be grown on them unless the soil is too sandy. This plant forms dense copses three to six feet in height, offering some of the bad features of tall weeds, but it is less objectionable than cocklebburs, burdocks and thistles, and it is rarely a troublesome weed on farms. It should be mowed or plowed under soon after flowering. This will rapidly improve the fertility of the soil so that grass may be grown. The grasses which survive best in waste land, unwatered lawns, or in parks may well be taken as an indication of those adapted for seeding vacant lots. Soil, rainfall and climate will determine which may be best in specific cases, but in general the following kinds are recommended: For the South, Bermuda grass, St. Augustine grass, and carpet grass; for the North, Kentucky blue grass, various-leaved fescue, creeping bent, and smooth brome grass. Common white clover in the North and Japan clover in the South are recommended for sandy soils. After the land has been leveled and covered with a turf it will require little further attention except an occasional mowing. The children, by their tramping, will keep down some of the weeds, and they may be encouraged to destroy others that appear. It is not expected that a fine, even turf will be maintained equal to that in the parks, nor is this essential for the purpose in view. The grass will remain green during most of the year, and when the leaves do turn yellow and decay there will not be enough of them to pollute the air or induce disease.

In the outskirts of cities or in villages where there is plenty of open space for the children, vacant lots may well be used by the needy or by people out of employment for the cultivation of vegetables, according to the plan tried in Detroit, Buffalo, Columbus, Brooklyn and Chicago, which has generally proved very successful for the purpose intended. Besides supplying the immediate wants of the deserving poor and providing healthful exercise, this work tends to give a wholesome taste for agricultural life. To obtain the highest benefit from vacant lots used for this purpose, and to prevent them from being overrun with autumn weeds, they should be cleared up and seeded either to crimson clover (where this will grow) early in the fall or later to rye. These plants will cover the naked ground and keep down weeds. Crimson clover will increase the fertility of the soil, and in the spring its bright flowers will repay many times the slight expense of growing it.

Where there are large areas of partly improved parks or subdivisions not yet placed upon the market, the vegetation may be

kept down at slight expense by pasturing sheep on them. This method is pursued in Druid Hill Park, Baltimore, and in Central Park, New York, and it is found that the sheep make very effective and very economical lawn mowers.

The work of destroying the weeds and improving vacant lots can doubtless be done best by municipal direction under the immediate supervision of the park or street departments. In the larger cities it may be difficult to obtain the necessary municipal legislation. City authorities may wait to feel the pressure of public sentiment, and public sentiment may need to be educated to a just appreciation of the benefits to be gained. A few good examples, which may be produced through individual effort or by the united action of a small community, will demonstrate the practical utility of the work and lead to its extension. Examples of this kind are now found in many villages and suburban towns. If the practice can be made general in the cities and towns throughout the country it will cut off one of the principal avenues for the introduction of foreign weeds.—From Yearbook, Department of Agriculture, 1898.

HOME SANITATION.*

By Miss S. King, San Antonio, Texas.

"Every wise woman buildeth her house; but the foolish plucketh it down with her hands;
She looketh well to the ways of her household and eateth not the bread of idleness."

Cleanliness, system and industry are the keynotes to scientific housekeeping. The home maker must add to these virtues the additional one of patience, tact, cheerfulness and amiability.

Some one has written: "She must possess the executive ability of a general, the logical mind of a scientist, and that intangible something of which saints are made."

Such is the model housekeeper and home maker. There are some who possess all these virtues and have with such traits the skill and health to execute all plans, and there are many who are willing, but through lack of training, circumstances, ill health,

*Prize essay in the contest on Home Sanitation read at the meeting of the Sanitary Improvement Club, San Antonio, Texas, August 7, 1899.—"San Antonio Express," August 8, 1899.

poverty or lack of appreciation, lose heart over the tremendous task which confronts each home maker. With lack of interest comes neglect of duties and unhealthful environments.

To keep up her own enthusiasm and to arouse the enthusiasm of others in everything that pertains to cleanliness and beauty should be the mission of every woman.

Listlessness and novel reading will never elevate home or society. Thinking, reading and organization into leagues and clubs will accomplish a great deal, but in the meantime each woman should be a club of one, a private "board of health" to elevate her home and work out her "own salvation." In such matters we are our own and our brother's keeper. Your own neglect of a sanitary law or a neighbor's neglect of the same may sow the seeds of typhoid fever, diphtheria, malaria and consumption far and wide.

No conscientious scruples should keep you from private and public protests should your neighbor be disorderly or unpleasant, yet you submit week after week to "odors" that make you ill in mind and body—the stumbling block of ignorance. Therefore ignorance must be crushed by education, there must be a vigorous campaign of education and restriction. If your neighbor will not listen to kindness and suggestions, then you owe it to yourself, your family, to the neighbor and to the city, to report all conditions that are not within the rules of proper sanitation.

It seems strange that such should ever be the necessity, for as far back as the Mosaic code, minute directions were given for cleanliness of person and camp.

Rich and poor must lend a hand from the home outward to the world and multitude, for, as Spencer says, "The entanglement of social relations is such that men's actions simultaneously affect the welfare of self, of offspring and of fellow citizens. Incapacity of every kind and degree causes unhappiness directly and indirectly."

Cleanliness, therefore, is egoistic and altruistic. Sociologists have demonstrated that we cannot improve even one human being or self without helping others. In this regard rich and poor share alike.

The man of wealth cannot build his marble wall and place plate glass within and say "I am secure." The germ of disease borne along by a light and frolicsome wind can steal within the palace as easily as within the poor man's cot.

Wealth may seal up or foster disease germs within its walls, unless there is absolute security against the return of the bacteria

from the water pipes and sewerage system, therefore domestic sanitation in relation to the art of plumbing has become a matter of national importance, because the healthfulness of the home and city depends largely on this art. Some arts are a luxury; this is a necessity. The nation's wealth and ability depend upon the brains and health of its citizens. The housekeeper must know enough of her profession to see that all mechanical contrivances are not only pleasing to the eye, but accurate and hygienic in construction.

As one's knowledge must be limited in this line, employ only the best workmen, economize on everything but your "sanitary appliances." See that plumbers have a license or diploma, that they are as well qualified for their work as teachers and physicians. If you would be fully protected from dishonest plumbing, see that wise measures are adopted by city and State.

It is your duty to be interested in this question. Sometimes the angel of death comes amidst a grand symphony, but ofttimes she comes to take the poor aching body from the swarming bacteria caused by neglect, idleness or dishonesty.

False economy and dishonest workmen join hands and place a poor trap which sends back impure air, disease-laden air. Sickness comes, death invades the home and all the powers of heaven and earth are blamed save "self" and "the plumber." An old conundrum asks: "Why is a plumber like a doctor? Because his mistakes are buried."

The plumber's and housekeeper's business is to prevent disease; the physician's to cure; if he fails to ease or cure, the merciful heaven smiles and gives rest and hope.

A German scientist found that the German soldier lost 5 per cent. of his time from illness; this under strict sanitary rules. Let women stop and find out how much of their time and the household time is lost under careless household discipline. Think of the filth, impure air, overheated rooms, improper and badly cooked food. It makes the gods shudder.

Attention is necessary to details on sanitary and financial grounds. The care of the sewerage system of the city is a public duty, but individuals must be forced to remedy all defective arrangements that lead to the main system. All drains should be provided with special means for flushing and inspection; where possible, drains should be laid on the outside.

A dwelling should not be built until the soil is drained, if it should not be dry. All pipes for sinks and lavatories should be of

iron or lead, and tested under water pressure by a trustworthy plumber. Have as little woodwork as possible; porcelain is easier to keep clean. Only enameled iron or porcelain should be used. Waste pipes from refrigerators, safes and ice boxes should not connect directly with the soil pipe, but should empty into open sinks properly trapped. Outlets should be protected with flap valves.

Kitchen sinks should be supplied with grease traps. Grease should never be allowed to enter the drainage system. Traps must be cleaned every few days.

All household fixtures should be scrubbed with soap, hot water and a cloth at least once a week.

Never use any gritty substance on enameled surfaces. Coal oil or gasoline on a cloth will remove fly specks, paint stains and nearly all discolorations.

To cleanse the kitchen trap a half teacupful of liquid lye or pot-ash should be poured in at least once a week; let it remain over night; flush trap and pipe the next day. The grease trap must be cleaned by taking out all the solid or greasy matter with a long spoon, then scrubbing and flushing. A metallic strainer and not a plug should be in all kitchen sinks.

Many housekeepers are aware of the danger from decomposing kitchen refuse and yet find no remedy. There is a simple invention which may be fastened to any stove, a sheet iron crematory in which the refuse is placed and when closed prevents all gas and odors from escaping. The ashes from this carbonizer are useful as a fertilizer.

Most housekeepers consider a copious washing with water all that is necessary to carry off refuse, but never was there a greater mistake—milk of lime is the only safe remedy; mix one part of such a disinfectant to about ten parts of water and it will prove useful and count toward health. To make this milk of lime is an easy matter; two pounds of quicklime to a gallon of water will answer the purpose.

Some housekeepers close the door or traps and imagine their duty done, but the little house-fly is busy at least, spreading with facility all the germs they may gather. At a recent lecture the speaker said: "Rooms must be swept once a week and dusted each day; beds aired every day; that linen sheets fostered rheumatism; that bed covering should be light in weight; all rooms should have plenty of air and sunshine. A basin of water in a sleeping room

absorbs impurities and should be changed each day. That plants are healthful in the bedroom, as they absorb our carbonic acid and give out oxygen. Long street dresses are unsanitary, untidy and unsafe, sweeping up the disease germs of the streets."

All this seemed but the A, B and C of an ordinary talk in physiology, so, imagine one's surprise when an old housekeeper said, with a sigh: "I can never do all that; I have learned so much."

If there is any simple contagious disease on the rounds, the mother removes her flock from school, forgetting the germs in her carpets, her furniture and kitchen sink. Where woodwork is seldom washed, germs settle in the casement and begin their deadly work. Hot water and any liquid disinfectant would have soon removed the danger.

Most families have a semi-annual upheaval, but this often means a hiding and shifting of debris. Sometimes unwholesome odors are made endurable by agreeable perfumes—cleanliness is safer and less costly.

When we think of the danger, the wonder is that anyone is well. Books should be aired, for within their pages may lurk disease and death—if the harm is a physical one, fresh air will cure, but if the harm is a moral one, nothing but fire will serve.

Furniture in a warm climate must be light in weight and color. Hangings should be of a subdued shade and not heavy. Matting is better than carpets where no servants are kept. Attention to such details will give the tired housekeeper sufficient extra time to look after all matters of sanitation.

Cooking must come within the range of minute attention, for there can be no proper sanitary conditions unless food is properly cooked and properly stored away.

Decaying vegetables, neglected meats—the picture is too pitiful to paint.

It is said that meat may be left for some time in hot weather by wrapping around it a linen cloth moistened with vinegar; the acid vapor keeps off the flies and the moisture causes cold by evaporation.

Vegetables may be refreshed by cutting the stem and placing the cut part in water. Never place vegetables in heaps. As some housekeepers are annoyed by cockroaches and ants, it is said that cucumber peelings or alum scattered around the place will destroy these pests.

In fact, alum (two pounds in four quarts of water) applied boiling hot over shelves and crevices will kill all insects and vermin.

Gnats do not frequent houses where chloride of lime has been exposed.

Ants sometimes require more patience—sprinkle a wet sponge with white sugar; the ants will go into the cells of the sponge and can be destroyed in hot water. This must be repeated until all are caught; this is a useful remedy for small house ants. To expose poisons in the cupboard or pantry might prove dangerous to some child or member of the household.

"Corrosive sublimate" is a substitute for cleanliness in case of non-mentionable pests.

If there is the slightest suspicion of poor drainage or that waste pipes are not clean, use some one of the following disinfectants:

Chloride of lime is cheap and good.

Copperas is excellent for sinks and cesspools. It will neutralize unpleasant odors and destroy deleterious matter.

Aromatic vinegar on a heated iron plate is pleasant. Common coffee or brown sugar, freshly burned and carried through a house or sick room will prove a simple disinfectant. Water may be purified by boiling or by stirring into it powdered alum, a teaspoonful in three or four gallons. This precipitates impurities. Water filtered through animal charcoal is still better.

The leaves of the China tree will keep worms out of dried fruit and moths out of woolen clothes. Pennyroyal scattered about the house will drive away fleas. A bottle of oil of pennyroyal uncorked will drive away mosquitoes. These little pests are not safe because they carry the germs of malaria, to say nothing of the trial to peace, sleep and good nature.

To clean carpets sprinkle with tea leaves and sweep. From every spot called home let cleanliness prevail. The task will repay in comfort and self-respect. There is no small matter in a home; it is the details that count in system, industry and success, for—

> "Who sweeps a room as for thy laws,
> Makes that and the action fine."

A GREENHORN about sixty years ago, who on his first visit to a steamboat, fell through the hatchway, down into the hold, and being unhurt, thus loudly expressed his surprise: "Well, if the darned thing ain't holler."

THE HOUSING PROBLEM.*

The problem of how to house the artisan and laboring classes has been more or less prominently before the public for many years, and various tentative efforts have been made by the Legislature toward its solution. During the present year the problem has again been brought prominently forward in the columns of the London newspaper press, and an attempt has been made by the Legislature to afford facilities for enabling occupiers of small houses to acquire the ownership of them.

In the space at our disposal we can only indicate the main conditions of the problem and some of the causes which render it so difficult of solution.

Scope of the Problem.—It must not be forgotten that the majority of the population of England and Wales belong to the wage earning classes, and that the whole of the wage earning population under present conditions pay what appears to be a disproportionate share of their total income in house rent. We may quote on this point the evidence given by Mr. Marchant Williams, Inspector of Schools for the London School Board, before the Royal Commission for inquiring into the Housing of Working Classes (1885). There is every reason to think that rents have increased disproportionately to wages since that date. Mr. Williams stated that from personal investigation of parts of the parishes of Clerkenwell, St. Luke's, St. Giles', Marylebone and other poor quarters of London, he found that 88 per cent. of the poor population paid more than one-fifth of their income in rent; 46 per cent. paid from one-fourth to one-half; 42 per cent. paid from one-fourth to one-fifth; leaving only 12 per cent. who paid less than one-fifth of their weekly wages in rent.

More recent evidence brings out even more strikingly the difficulties of the problem. The rent for each unfurnished room of a tenement rented by a family of the laboring classes is often four to six, or even more, shillings a week. Even when municipalities have attempted to build and let tenements to the poor, the cost per room has been in London 3s., 3s. 6d. and 4s. per week. Birmingham has managed to let cottage flats at 1s. 6d. per room per week, while Liverpool has succeeded in reducing the cost in certain very cheaply though durably built tenements to 1s. per room, the lowest

*From "The Practitioner" (London), July, 1899.

rental being 2s. 6d. for a tenement consisting of two rooms and a scullery.

The above instances show that even when the element of profit is eliminated and houses are let at a price which merely covers all outgoing expenses, the days of cheap rental have gone, and the working classes must necessarily pay a much higher proportion of their earnings in rent than those of a higher social status.

Is there anything to be said *per contra?* One of the causes of expensive houses (not the only, and probably not the chief one) is the high wages of workmen. Sir R. Giffen showed some years ago (Presidential Address, Royal Statistical Society, 1883-4), that in the textile, engineering and house building trades the workman gets from 50 to 100 per cent. more money than fifty years earlier for 20 per cent. less work. At the same time, with the exception of house rent and meat, most articles required by the workman have diminished in price, the reduction in the price of wheat being particularly remarkable. The exception as to rent is the all important one with which we are now concerned. The conditions of housing of the largest proportion of the wage earning classes are still unsatisfactory, though they have certainly improved greatly in the last seventy years. Some light is thrown on the present state of matters by the census data which are available.

Amount of House Room for Each Family.—The 1891 census for the first time collected information as to all tenements with less than five rooms. A "tenement" was defined in the census papers as "any house or part of a house separately occupied either by the owner or by a tenant." According to this standard 5.1 per cent. or nearly half of the English population lived in tenements containing only four, or less than four, rooms; 2.2 per cent. of the total population living in single roomed, 8.3 per cent. in two roomed and 11.1 per cent. in three roomed tenements. Closely connected with these important facts is the rapidly increasing urbanization of the population. Thus, at the census of 1861, 37.7 per cent. of the total population of England and Wales was rural; at the census of 1881 this population had decreased to 33.4 per cent.; and at the census of 1891 to 28.3 per cent. It is in urban populations that the chief overcrowding occurs. Thus, while at the 1891 census 2.89 per cent. of the total urban population occupied only one room, in rural districts only 0.44 per cent. lived in one roomed tenements; 9.38 per cent. of the total urban population occupied two roomed tenements, only 5.65 per cent. of the total rural population, and so on.

Standard of Overcrowding.—In the census report the very moderate proposal is made to take as a standard of overcrowding tenements which have more than two occupants per room. This would exclude all single roomed tenements with not more than two occupants, all two roomed tenements with not more than four occupants, and so on. When this is done the census returns show that 11.23 per cent. of the total population occupy overcrowded tenements, the greatest proportion of these being in two roomed tenements. The proportion of such overcrowded tenements is 12.31 per cent. in urban, as compared with 8.46 per cent. in rural, districts. When studied in detail, the differences between various great towns in respect of proportion of population living in an overcrowded condition are most striking, and would repay detailed study, but this is impracticable here. It is sad to think, however, taking the average result given above, that in towns over 12 per cent. of the population live in such an overcrowded condition that even when all living rooms are counted as bedrooms there are still more than two persons sleeping in each room. The real facts are considerably worse than this; as, even among the poorest an attempt is made not to use the living room or kitchen as a bedroom.

Factors Militating Against Improvement.—The matter is chiefly one of rental. The higher the rental, the more sub-letting is indulged in, or has to be submitted to, and consequently the smaller the number of rooms for each family.

One of the causes of high rental is the greater expense of building materials and labor in recent years. It must be confessed further that the strict enforcement of building by-laws and regulations, the system of house-to-house inspection by sanitary inspectors and the enforcement of sanitary repairs and alterations whenever required, have tended to increase rentals, and thereby have tended to increase overcrowding. In an interesting paper ("Journ. San. Institute," April, 1899), Dr. J. F. J. Sykes has recommended the adoption of a statutory definition of overcrowding, "nothing short of 400 cubic feet per head for adults" being satisfactory. He adds: "The pressure of population tends to squeeze the people closer and closer together, and the only check to this disease producing pressure is the minimum limit imposed by law and vigilantly enforced by inspection." The standard urged by Dr. Sykes is not too high, but with a continuance of high rentals its enforcement obviously implies increasing pecuniary hardship for the poor, and the perception of this has led many local authorities mistakenly

to refrain from discharging their statutory duties in enforcing the abatement of overcrowding. Such local authorities have not sufficiently realized the fact that it is overcrowding which enables landlords to secure excessive rentals, and that local authorities which enforce by-laws for houses let in lodgings and for common lodging houses diminish the excessive rent earning power of tenement property to something more nearly approaching its normal limit.

Effect of Clearing Unsanitary Areas.—Local authorities have power under Part I. of the Housing of the Working Classes Act, 1890, to clear away houses, courts and alleys, which, by reason of their narrowness, closeness and bad arrangement, or the want of air, light, ventilation or any other sanitary defects, are dangerous or injurious to the health of the inhabitants of the buildings in such area, and where the defects cannot be remedied otherwise than by demolition of the area in question. These powers have been acted upon by various local authorities, and the general result has been so exorbitantly expensive as to make the same local authorities hesitate greatly before again attempting to enforce Part I. of the above act. In London two areas cleared by the County Council worked out at something like £300 and £500 per family respectively. In Brighton two small areas were cleared, with the result that the cost per person displaced was £27 12s. 9d. in one area, and £30 15s. 0d. in the other; while the net cost (after reselling the land for building purposes) was £1 14s. 3d. and £2 5s. 6d. per square yard respectively.

It is becoming daily clearer that provision for rehousing should precede demolition of unsanitary areas. This would have a beneficial effect in two directions: (*a*) the value of the unsanitary property, enhanced by the stress of crowding, would be lowered toward its proper point, and (*b*) the same persons could be rehoused as are actually displaced. In most schemes hitherto carried out, the new houses have been too expensive for the displaced tenants. This is a most difficult question, and its consideration and a discussion of the municipal attempts at rehousing attempted in the past must be left for discussion on another occasion.

A Pinching Plea.—A lawyer, in Ireland, who was pleading the cause of an infant plaintiff, took the child up in his arms, and presented it to the jury, suffused with tears. This had a great effect, till the opposite lawyer asked what made him cry? "He pinched me!" answered the little innocent. The whole court was convulsed with laughter.

ARTIFICIAL FOODS; WHY THEY EXIST AND WHAT THEY ARE.

By J. Percy Remington, B.S. (U. of P.).

In this paper an endeavor will be made to discuss, in a practical manner, the subject of Artificial Foods, touching upon the reasons for their existence, the principles of their use, the composition and manufacture of the various kinds, and the great possibilities which are open to this comparatively new form of nourishment which is now occupying so much of the attention of the medical men and scientists of the world, and the utility of which we are just beginning to realize.

Artificial foods so far have found their greatest use as a substitute for human milk in infant feeding, and although they are sometimes used in diseases of adults, yet, since there are many other forms of diet which can be employed in such cases, they have not found as extensive an application in this field.

It is a well-known fact that among the more cultured classes mothers frequently do not have a sufficient quantity of milk to suckle their young, whereas among the poorer classes, for instance, the peasant women of France and Germany, this statement does not hold true, and it has been this fact that has forced us to find some substitute which could take the place of human milk and supply all those ingredients which are necessary for the perfect development of the young.

The belief has been entertained that a paper on this subject would be of interest to the Pennsylvania Pharmaceutical Association at this time, because pharmacists are probably more frequently consulted by parents than even physicians, and the future welfare of our race, in a measure, depends upon the raising of the children. This, therefore, becomes a subject upon which none can afford to be ignorant.

Although much has been written upon this subject by authorities all over the world, no one has so far undertaken to collect this scattered knowledge into one book, so that, in order to get a complete understanding of it in its physiological, medical, chemical and commercial aspects, it is necessary to refer to many text-books,

journals and even note-books. Nor do the authorities all agree on many of the vital points concerning the best methods of artificial feeding, and the various physiological phenomena which take place in that most fearfully and wonderfully made organism—the human body. In other words, this subject has not yet been reduced to a science.

We can best approach this question by beginning with the general subject of foods for man, touching upon the various kinds, their use, their composition, and the process by which they are converted from their crude state into forms serviceable for the maintenance of life.

Food is that "which is eaten for nourishment." Man's food consists of animal, vegetable and mineral matter, and must supply a sufficient amount of proteids, carbohydrates, fats, mineral salts and water to completely repair the waste that is continually taking place and allow the organism to grow.

Various foods supply these elements in different proportions, and are useless or valuable according as they contain more or less of the essentials, and any food which possesses these five substances in proper proportions is capable of perfectly sustaining life, for each supplies the necessary material for the development of tissues, nerves, glands, juices, fat, bones, ligaments, etc., and for the maintenance of the bodily temperature, and the production of energy.

The proteids or albumenoids contain nitrogen and supply the elements for the foundation and repair of the tissues, brain, muscles, nerves, glands, blood corpuscles, and the resisting power against disease. Protoplasm, the centre of cell life, is formed of and nourished by proteids. They are therefore the most important elements in our food, and are the only ones, when used alone, that are capable of sustaining life.

They may be of animal or vegetable origin, such as egg, meat, milk and the gluten of cereals.

The fats and oils are second in importance, as they supply by combustion the heat necessary for the body, and without which the activity of the juices, the digestive ferments and many of the chemical reactions taking place in the body would be destroyed. They also are the main source of our energy, or, to use a crude simile, they are the oils burnt as fuel to keep the engine running. They may be of vegetable or animal origin, as lard, tallow, butter, olive or cottonseed oil.

The carbohydrates are the next in importance and are employed in the production of fat chiefly, although they also assist the fats in contributing to the production of heat and energy.

They also may be of animal or vegetable origin, although chiefly of the latter, as cane sugar, starch and milk sugar.

The salts supply the chemicals necessary for the formation of bones and the juices, and are derived from both animal and vegetable sources.

Water is the last but not the least in importance, as about 70 per cent. of our body weight is composed of it, and from 75 to 80 ounces per day is needed. It serves for diluting the fluids of the body, for moistening mucous surfaces, as a solvent for food and a distributor and regulator of heat, and enters into all chemical reactions that take place in the body.

There are very few foods which can be directly utilized by the human economy without first undergoing a process of physical and chemical change or digestion.

This process takes place in various stages in the alimentary canal. In the mouth the food is mechanically subdivided, ground up and masticated, in the stomach it is thoroughly mixed with the digestive juices and allowed to pass a little at a time into the intestines, where the valuable material is extracted and absorbed. In other words, in this great factory the mouth is the mill room, the stomach the laboratory, and the intestines the shipping department where the products are carefully selected, classified and distributed throughout the various parts of the body.

As the use of proper food is the source of our life and health, so the use of improper food may be the cause of disease, and in such cases the best cure is the removal of the cause by the substitution of proper feeding. Hence we see food acting in the double capacity of a means of nourishment and a medicine. It must not be confounded with medicine, however, which is a remedy for disease, but it is very convenient when we can, by selecting a proper food, promote life and cure disease at the same time.

A very large proportion of the diseases of children results from some form of insufficient or improper feeding, and as very often the evil effects then produced are carried on to maturity and show themselves in dyspepsia, indigestion, deformities, etc., the question of dietetics assumes a very serious aspect. It is for this reason that artificial foods have been received with so much favor by physicians, and the subject has received such careful consideration. It is very fortunate that so much is being said and done in this di-

rection, for a practical knowledge of the feeding of infants and of the sick is of the most vital importance to mothers, nurses and the general public, and it is just as necessary to know what to avoid as what to eat.

Having taken up the question of foods in general, their composition, the importance, specific uses and the relative value of the five ingredients, proteids, fats, carbohydrates, minerals and water, let us consider the various forms of artificial foods on the market, remembering that they are valuable only as they supply the above essentials in the requisite proportions, in a form physiologically capable of digestion and sufficiently palatable to be eaten.

The first substitute that is naturally employed for this purpose, because of its similarity to human milk, and its accessibility, is cows' milk. For adults it can be used fresh and without dilution, and is employed very extensively in this way, but for infants it is generally diluted by the addition of two parts of water to one of milk.

Theoretically this is the best and most serviceable substitute that can be used, and for this reason milk laboratories have been established in the large cities of this country for the purpose of furnishing pure sterilized, modified milk of any desired proportion of casein, cream and lactose. The milk of goats, asses and mares has been employed as a substitute with some success, but owing to practical difficulties can never have any very extensive use. Cows' milk, no matter how carefully modified and prepared, cannot be taken by all children, largely on account of the following facts: The casein is present in a much greater proportion than in mother's milk, is not nearly as digestible, as it coagulates in heavy masses instead of the fine flocculent curd of human milk. It is deficient in milk sugar, contains many bacteria, including some pathogenic varieties, is acid in reaction, whereas human milk is persistently alkaline, and is open to the two practical objections, that it requires care in keeping, and trouble in modification and preparation.

It would be impossible to take up and describe each different food upon the market in detail, and do justice to all, so for purposes of study it will be most convenient to divide them into general classes.

The points which it will be worth our while to consider can best be taken up under the heads of composition, method of manufacture, and the advantages and disadvantages they seem to possess. It would be well to also bear in mind that the theories upon which

the composition of the foods of commerce is based, although necessary to their existence and useful for advertising purposes, are, nevertheless, not to be considered always as based upon fixed, definite and accepted laws, and the best food for a child or an adult is the food that, after many trials, gives the best practical results, no matter what theory it may represent, or what may be claimed for it. The old adage: "What is one man's meat is another's poison," is applicable to this condition, and the bare truth, established by practical experience, remains, that there is no artificial food which will infallibly suit every case.

Manufactured foods may be conveniently divided into the following classes: predigested foods, milk foods, cereals and complete foods.

By milk foods we mean those which are prepared from cows' milk, the chief representative of which is condensed milk. It is prepared by slowly evaporating off the water at a moderate heat in vacuo till the milk has assumed a syrupy consistence. There are many brands of condensed milk on the market, and may be of two varieties. The "plain," which is condensed to about one-fourth its bulk, with the addition of a small amount of cane sugar, and the "stronger," in which the condensation is carried further, and a much larger quantity of cane sugar is added, sometimes running as high as 70 per cent.

This makes a very cheap food and is easily prepared, requiring only dilution, and is quite palatable, and hence is used largely among the poorer classes. It is somewhat laxative in its effect, which is an advantage quickly realized by the nurse. Condensed milk, however, is not a satisfactory food for permanent use. Children fed on it thrive very well for a time and rapidly gain in weight, but the flesh formed is flabby, with large amount of fat, and it has a tendency in time to produce rickets, marasmus and general symptoms of malnutrition.

Another form of milk food is that which is prepared by predigestion by some ferment, such as pepsin or pancreatin. There are very few foods of this kind upon the market, as their field is very limited. They find their best use as a temporary expedient after surgical operations or where the alimentary tract is so impaired that digestion becomes impossible, and it is necessary to give some food which can be directly absorbed without any effort on the part of the invalid.

When, however, they are employed for permanent nourishment

they are detrimental and demoralizing, for they encourage the digestive functions to become lazy and finally rob these organs of their ability to obey the commands of nature. Thus we impair instead of developing and strengthening vital parts of the body.

There are also condensed creams and peptonized condensed milks on the market which combine the features of the two above classes, but are not very important.

Among the other foods of animal origin, although of more recent application, are those prepared from beef.

Of the many beef juices on the market it will suffice to remark that they furnish very concentrated nourishment, since most of the indigestible fibre, muscle sheaths, blood-vessels, etc., are removed in the process of manufacture, and water is driven off by evaporation. They have quite an extensive use, but mostly for adults, being very seldom used for children except as an addition to milk or other food.

Eggs offer a remarkably efficient form of nourishment, as they contain proteids and fat in a concentrated and assimilable form, are easily procured and prepared and quite palatable.

Fresh eggs have always been a very popular food for both adults and infants as an addition to milk and other kinds of diet.

During the last few years attention has been called to the value of eggs as a substitute for the indigestible casein in milk foods, on the ground of their digestibility and nutritive value. There are three strong points in favor of the egg as an ingredient of artificial food:

(1) That when it is desiccated and finely powdered it is effectively preserved against decomposition.

(2) It forms very fine and flocculent masses on coagulation, and hence gives the greatest freedom to the digestive juices to act upon it, and

(3) That it exerts an active influence upon the mucous membrane of the stomach, allaying irritation and soothing inflamed surfaces.

The greater number of artificial foods belong to that class in which cereals are used as a basis.

These prepared farinaceous infant foods are made by the following methods:

(1) Application of heat alone.

(2) Digestion with malt or diastase combined with heat.

(3) Addition of animal matter to cereals after dextrinization.

The first class comprises all those foods made with cereals alone and intended to be used as modifiers of cows' milk.

Wheat, barley and oats are the grains used in their manufacture, and the starch present, often amounting to 75 per cent., is partly dextrinized by the cooking, cellulose and indigestible matter being more or less completely removed in the process. All that can be claimed for these foods is that they are a useful addition to cows' milk for adults and older children, but contain too large a percentage of starch to be of value for young children, as very few infants develop the ability to digest starch till the sixth month.

In justice, it must be said, however, that practical experience seems to show that a small percentage of starch is not only often digested by infants, but has a very beneficial, mechanical effect in increasing the peristaltic action, exerting a laxative tendency and aiding digestion.

The second class, the malted foods, had their origin in the theories, and are the result of the experiments of Liebig, and for that reason are often called "Liebig Foods."

They are made of equal quantities of wheat flour and barley malt with a little bran and about 1 per cent. of potassium bicarbonate added. These ingredients are mixed with water into a paste and allowed to undergo fermentation, which converts the starch into soluble carbohydrates, maltose and dextrin. The mass is then strained, pressed, extracted with water and evaporated, dried and powdered. In some of the foods a small percentage of starch still remains. The general characteristics of these foods are complete solubility, a strong and sweet taste, agreeable to most people, but which may, by constant use, become nauseating. They are easily assimilable, require little digestion and are quickly prepared. They are not complete foods, however, as they contain little or no fat and no animal proteid, although there is albuminous matter present in the form of gluten. They are, therefore, not to be used alone, but, like the first class, should be prepared with milk.

In the third class of foods an attempt is made to supply both vegetable and animal foods, or, in other words, to make a complete food; they are of the more recent manufacture and are the result of the practical experience of the manufacturers of the previous class of foods.

This class does not comprise a large number of products, but has met with greater favor and is certainly a step in the right direction.

They are of three kinds:

(1) Such as are composed of an extract of barley and wheat, to which powdered, dried and predigested milk is added.

(2) Those composed of dextrinized cereals and unpredigested dried milk.

(3) Those composed of dextrinized cereals, sugar of milk and desiccated powdered egg.

The first kind, that made from predigested milk and an extract of cereals, is similar to the malted foods, having a strong and sweet taste, but is to be taken with hot water only, and hence is easily prepared, and has found a very extensive use, particularly among adults.

It, however, is deficient in fat, containing less than 1 per cent., and the presence of such a large quantity of sugar is likely to produce fermentation in the stomach and intestines. The effect of these foods are manifested by the rapid production of fat and a gain in weight, and children may be reared upon them exclusively, but as they possess no antiscorbutic property they are likely to produce scurvy. Moreover, these foods are open to the same objections that predigested foods are, namely, that their ingredients, being converted into already assimilable forms, do not allow the digestive juices to perform their proper functions.

The second class seems to be open to less objection on this ground, as neither the cereals nor the milk are predigested during their manufacture. In other respects they resemble the preceding closely, except that they require cooking before administration.

The third form, foods made from dextrinized cereals and desiccated egg, rely upon the substitution of egg-albumen for the less easily digestible casein, the dextrinization of the cereals by a double process of cooking (first being boiled and then baked), and are milk foods only in this sense, that sugar of milk alone is present. They possess the following advantages over the others:

They are of a mild, palatable taste, not excessively sweet (as they contain no sucrose or maltose), the casein is replaced by the more digestible egg-albumen and they are not predigested. They are open to these two practical objections, that like the second class they require cooking in their administration and are also deficient in fats. For this reason milk and cream must be added, the milk supplying the antiscorbutic property.

We have now covered all the classes of artificial foods and have discussed their composition and utility in the light of the laws laid

down as the result of practical experience by the authorities on this subject, and in conclusion we find that they are all more or less useful, but that they all possess certain definite defects. That no one can tell whether a certain food will be successful in any certain case till it has been tried, and that, as we have said before, the best commercial foods are those which supply the five essentials in the requisite proportions, in a form physiologically capable of digestion and sufficiently palatable to be relished. It is clear, then, that since none of these foods meet all these requirements completely, the problem of artificial feeding has not yet been completely solved.

Yet one cannot glance through any of the best pharmaceutical or medical journals or literature of to-day without noticing the articles written on this subject by the most noted scientific men, and without realizing that science and art are combining their forces and exerting the greatest activity in the attempt to solve this problem.

Judging from the great interest that this subject has excited, not only among the scientific classes, but with the community at large, resulting in a universal demand for a perfect artificial food, and considering the unlimited resources of this country and its people, the great possibility of supplying this demand, and thus meeting our obligations to humanity, seems almost within our grasp.—"American Journal of Pharmacy," August, 1899.

CHRISTIAN SCIENCE—DIVINE HEALING AND OSTEOPATHY.

By F. W. Bullard, A.M., M.D., Los Angeles, Cal.,
Professor of Chemistry, Medical Department of the University of Southern California.

Any system of religion, philosophy or practice that numbers among its adherents thousands of people of average intelligence, cannot be entirely false. But that system of thought which has been the result of careful evolution, is in all probability, the one most free from mistakes, and its followers are, at the same time, the most modest in their statements, and the most willing to be convinced by proper evidence. Such persons are ever ready to assimilate the truth from any source, being mindful that the field of science as now known, bears but a small relation to the yet undis-

covered world of nature. Yet, they are rightfully on the alert to prove all things, and cling fast to the good. We believe that the regular medical profession are philosophers of this kind. They are ever patiently studying, sifting the wheat of fact from the chaff of mere opinion, always having as an end the amelioration of human suffering and the stamping out of disease. Accordingly they are willing to give anything if so they may benefit their patients.

It has been the policy of the medical fraternity to silently endure the mis-statements of the disciples of various pseudo-medical cults, but I deem it proper upon this occasion to briefly review some of the so-called systems practiced in these modern days, pointing out what is good in them, as well as their errors.

From time immemorial the question of the origin of disease has been one of the unanswered riddles of nature. From the remote past and from many sources has come the theory that disease is due, either to the wrath of an offended Deity, or to the malice of an evil power. At the dawn of history this belief was general in India, China, Chaldea, Egypt and Assyria. Our own sacred Scriptures, the treasury that preserves for us the thoughts of the ancient world, have given color to the same view. The leprosy of Miriam was pronounced in judgment for sedition, that of Uzziah for presumption to perform priestly rites, that of Gehazi for covetousness and lying. Again, the boils of Job were allowed by God at the suggestion of Satan to test his integrity. In the New Testament hysteria, epilepsy and insanity are almost invariably spoken of as demoniacal possession. Indeed, in all religious cults the idea seems to be fully fixed that the mentally unsound are so on account of a visitation of the gods or malicious agency of demons. On account of this firm belief the theologians of the middle ages devised miraculous methods of cure, looking to the appeasing of divine anger or the thwarting of satanic malice. Blinded by the blighting belief in dogma, and the supposed letter of the law, the Christian people instituted "mad houses" where the devils were supposed to be cast out of their victims by cruelty. Men and women, whose distempered minds might have been restored to health by gentleness and kindness, were scourged and tortured in the witch towers of mediæval Europe. Protestant and Catholic were steeped in the same superstition, Luther and Calvin among the rest. In the great witch-burning age, just after the reformation, the new church vied with the old in carrying out that horrible command, "Thou shalt not suffer a witch to live." John Wesley, in spite of the strength and beauty of his character, held, "to give up witchcraft is to give up

the Bible," and insisted that bodily diseases were caused by devils.

"Divine" scepticism, however, in spite of all persecution made its way, and finally in 1768 the truth was officially declared by the Parliament of Paris that possessed persons were to be considered as simply diseased. One of the best results of the French Revolution was the saving of Pinel, the great physician, from the churchmen, who were too busy just then looking out for their own heads to persecute heretics. Pinel substituted kindness and gentleness in the treatment of the insane for exorcisms, prayers, processions, holy water, ringing of bells and whippings. He took the miserable victims out of dungeons and put them into sunny rooms, struck off their chains and gave them appropriate exercise. Thus after over a thousand years of theologic barbarism, the modern world returned to the truth discovered by Hippocrates 500 years B. C., viz.: that madness was simply a disease of the brain. We mention these facts to show how much nearer this noble heathen was to the thought, aspiration, example and ideals of Jesus of Nazareth than were the benighted professed Christians of the middle ages.

We mention this also to show how unscientific and how false are all theories of disease based upon real or so-called supernatural revelations.

Of course the world has advanced far beyond the above mentioned theurgic treatment, but the fundamental error of theologians, that disease is caused by the wrath of God or by the machinations of Satan, leads to the idea of appealing to the Deity to arbitrarily remove the curse. Hence, we have among us the "Divine Healer." The "Divine Healer" claims that, at his request, that power which both makes and keeps in operation the laws of health and disease, laws which have not changed an iota in centuries, laws which never have failed, the "Divine Healer" claims, I say, that that power will suspend his immutable laws, and immediately without delay the blind will see, the deaf hear and the lame walk. He will quote James, "The prayer of faith shall save the sick," forgetting the admonition from the same author, "Faith without works is dead." Most of the "Divine Healers" are sincere. They are usually respectable, but their very virtues make the fallacy more dangerous. However, some of the Evangelists of this propaganda are monumental hypocrites, the sorcerers of our day like Simon of old. The original Simon was a successful quack and a religious impostor of Samaria, yet he accomplished so marvelous cures that the people called him "The great power of God." But Simon the wise knew better, and when Philip accomplished real miracles,

Simon supposed, of course, that Philip was a sorcerer also and offered him money to be let into the secret of his superior trickery. He was overwhelmed at Philip's crushing reply, at his audacity to think that the Grace of God could be bought for money. Every once in a while there appears among us some modern Simon, who dares to pretend to sell the favors of Almighty God under the gauzy veil of voluntary thank offerings from a credulous and duped public. The talisman that reveals the sincere believer in the power of "Divine healing," from the itinerant peddler of supposed favors of the God he blasphemously represents, is the contribution box. If God gives salvation from disease, that salvation cannot be bought by money.

There is another system which boasts of a numerous following, which was christened by its founder, Christian Science. The high priestess of this cult, in the introduction to her work, "Science and Health," says: "No intellectual proficiency is requisite to the learner." After a careful perusal of her writings I am led to believe that that statement is the most appropriate one in the entire book. For certainly one must abandon the entire field of human knowledge and violate the last dictates of reason and common sense to accept the dogmas of this travesty of philosophies. The central idea of "Christian Science" seems to be the nothingness of everything. Matter is non-existent, except in the mental vision of the race. It is an illusion. Page 19. Every supposed law of matter is null and void. Page 379. "The metaphysics of Christian Science," says Mrs. Eddy, "like the rules of mathematics, prove by the rule of inversion. For example, there is no pain in Truth and no Truth in pain; no nerve in mind, and no mind in nerve; no matter in mind and no mind in matter." Page 7. Why not say there is no pleasure in truth and truth in pleasure; nothing in mind or no mind in anything; or any nonsensical jargon placed in alliterative juxtaposition? On page 294 Mrs. Eddy says, "All disease is a delusion." On page 416 she says: "Tumors, ulcers, inflammation, pain, deformed spines are all dream-shadows, dark images of mental thought, which will flee before the light." That reminds me of a case I knew a few years ago. A little fellow was suffering from that most aggravating of pains, a severe toothache. The mother was a worshipper of the modern goddess of "Christian Science." She said, "Now, Johnny, your tooth does not ache. Just say it doesn't ache and it will not hurt you." The young hopeful made the sensible reply: "It's a blamed lie, it do ache."

And that's what's the matter with the whole system. It's a blamed lie.

There is another fad to which the dear public have of late paid considerable attention. This, however, is of a much lower order than "Divine Healing" and "Christian Science. "Divine Healing" is a fanaticism that sometimes attacks people of a highly religious nature. While "Christian Science" finds its home in the minds of mental Don Quixotes. This fad, however, goes under the nonsensical name of Osteopathy. According to the cards sent out, this form of quackery is thus defined: "The system of treating disease by the correct adjustment of the bones and their attachments, and through them other parts of the human system, thereby causing all parts to perform their functions in harmony, procuring through the veins, arteries, nerves and other vessels a free and uninterrupted flow of all the fluids and substances that pertain to life." Osteopathy summarizes pathological conditions under three heads—one, displacement of bone, cartilage, ligament and muscle; two, disturbance of the fluids of the organism, including blood and lymph; third, disorder of the nervous system. There is not a word about microbic diseases, tumors, or the specialties in medicine. Their treatment is confined entirely to massage, a procedure in which a thoroughly trained nurse ought to be versed, and a form of passive exercise of undoubted value in neurasthenic conditions. But massage in many cases would be a most dangerous thing. It might prove instantly fatal in appendicitis, and exceedingly dangerous in tuberculous diseases of the spine or joints. But the osteopathic graduates have neither the instruction nor the ability to tell when their sole therapeutic measure should be or should not be employed. To dignify a simple therapeutic procedure into a system of medicine, and to apply it to all human ills is a manifest absurdity. The only raison d'etre for osteopathy is the gullibility of the public. Both that part which as patients, furnish the coin of the realm, and those, as students, who give up enormous tuitions to learn how to get even by treating others. Thus carrying out the new revised version: "Do others or they will do you." That the osteopaths will attempt to treat any disease by their manipulation, irrespective of whether massage is indicated or not, I know from personal investigation. Two years ago it was my duty to investigate the claims of a renegade doctor who applied to the Los Angeles County Medical Association for permission to dissect for the benefit of the osteopaths. I asked him if his pupils would, upon graduation, treat diphtheria by osteopathic

methods. He said, "Yes." I then asked him, having ascertained that he had children of his own, if he would allow any one to treat that child by the osteopathic method if it were seriously ill with diphtheria. He blushed, hesitated, and finally stammered the humiliating confession: "Doctor, to tell the truth, I am only out here running this concern on a salary."

The Philadelphia "Journal of Osteopathy" makes the following frank statement in speaking of osteopathy: "It solves the problem of financial support. Daily bread is the necessary end of nearly all toil. In the sweat of thy face shalt thou earn thy bread, is a law not many can evade. Many a man works as he does, not because he wants to, but because he must. Many a father toils on $50 a month, many a woman or girl works and worries along with $5 a week. Ordinarily this cannot be helped. Now, with the opportunity presented by this new profession, this is unnecessary. People do not need to work and slave on starvation wages. To say the least, osteopathy is a financial success and earns all it gets, and gets it freely from its patients. It yields the largest returns from the least capital. In all independent business large capital is required, and yet large incomes do not necessarily follow. Small incomes are the rule. Not so with the osteopath; his only capital is his tuition. His brain is his bank, his skill his capital stock, his hands his merchandise, the suffering world his market and his cases his profits."

From the osteopaths themselves, we see the real reason for the existence of that so-called school is a financial one.

The practitioners of all these methods of treatment are always ready to cite numerous cures that have been obtained under their respective systems. There is no doubt of the fact that many people have been benefited, and even permanently cured, by each of these methods. The "Christian Scientist" and the "Divine Healer" accomplish this result just as Simon Magus did—by suggestion. A critical survey of the actual cures offered by the disciples of these cults will show that they have always occurred among the neuropaths—people suffering from manifold disturbances of nervous origin, the neurasthenics, hypochondriacs and hysterical personages. Suggestive therapeutics is of utmost value in the treatment of such cases, a fact well known by the legitimate physician, and one, too, employed by him long before the term hypnotic suggestion was ever invented. The buoyant tonic of hope has ever been recognized, and this doubtless accounts for the seeming betterment, temporarily, of people suffering from grave and neces-

sarily fatal organic diseases when they are under the treatment of a method which loudly promises a cure.

The osteopath accomplishes his results by the same power of suggestion, to which he has added the single therapeutic measure, massage. The regular practitioner has for years used the same, but he knows when to use massage and when to enforce rest and quietude. The "Christian Scientist," the "Divine Healer" and the osteopath attempt to apply their one idea to cure all things; the regular physician uses all things to cure anything, but each in its proper place.

Other factors which swell the figures of those cured by the illegitimate methods of practice are false diagnosis and faulty prognosis. People frequently are not suffering from the maladies from which they think they are. Such people are very apt to enjoy poor health, get well under the hands of a medical fakir and loudly proclaim the fact ever afterward. Again, those actually sick often think themselves well when they are not. J. M. Buckley, in the "New York Christian Advocate," apropos of this subject, says: "One of the most amusing and at the same time sad things is to see certificates published in religious papers and others, signed by men certifying that they have been cured of disease by a machine or a medicine which is an infallible cure for the malady spoken of, when to our knowledge the signers of said certificates subsequently die of the same disease. We have noted fifteen cases of as many different remedies which, in corroboration of this statement, we should publish, were it not for the grief it would give to the bereaved; and were we to publish them without names, the people would deny the fact."

Let us briefly compare legitimate medicine and the pseudo-medical systems in the treatment of that disease upon which the entire scientific world agrees, namely, diphtheria. Its pathology and treatment is now as thoroughly established as is the rotundity of the earth. No educated practitioner would treat diphtheria in any other way than by antitoxin. In brief, the following facts are established: The diphtheria plant or germ being inhaled, grows usually upon the mucous membrane of the throat. This plant generates poison, just the same as the yeast plant produces alcohol, and this poison—called the diphtheria toxin—absorbed into the blood, produces a diseased state of the nervous system, heart and kidneys, and these diseased organs failing in their function cause death of the victim. Sometimes the patient lives. It does so because there has been elaborated in the blood a chemical product

which is an antidote to the poison of the disease. Man has found that by giving a small and repeated dosage of the diphtheria poison to a horse, he can render that animal immune to the disease. By collecting the blood serum of the immunized horse and injecting the same into the body of a person suffering from diphtheria, he can at once neutralize the poison produced by the disease, and, if the secondary changes have not already taken place, the patient will recover. This is nature's immutable law, the way God has ordained for salvation from diphtheria.

Let us suppose here is your child with the cruel clutch of membranous croup—or laryngeal diphtheria—upon its throat. Statistics show that, until the advent of antitoxin, nine out of every ten attacked by this malady died. Now, with serum therapy and intubation in the hands of a competent physician and skilled surgeon, these figures are exactly reversed, nine out of every ten afflicted recover, and it is more than probable that the tenth case would recover if it could be seen early enough.

Would you allow the "Divine Healer," be he ever so sincere, to lift his impotent prayers to God to do a miracle what man is willing and ready to accomplish, while the innocent child (a victim alike of the disease and religious fanaticism) is slowly choking to death before your very eyes? All the prayers of Christendom would be as dust in the balance compared with the proper use of antitoxin.

Or, when facing that form of death which man in his wisdom has conquered, will you listen to the gibbering idiot who says disease is a delusion and all the laws of matter null and void?

Or, will you massage the muscles of the dying child "to obtain the correct adjustment of the bones and their attachments, thereby causing the parts to perform their functions in harmony, procuring an uninterrupted flow of all the fluids which pertain to life?" How rational it is to cause a more rapid flow of the blood tainted to death with a poison five thousand times as virile as the bite of a rattlesnake!

"Christian Science," "Divine Healing" and osteopathy, when face to face with death, are weighed in the balance and found wanting; to attempt to waste the precious moments when medical skill has an almost infallible remedy at hand is nothing short of manslaughter. And the cracked-brained devotees who would delude the people in such an extremity are verily guilty of murder.—"Southern California Practitioner," July, 1899.

MOSQUITOES AND MALARIA.

For many years we have known that malarial fever and certain similar animal diseases are caused by minute parasites of the blood. Considering the number of investigations on the etiology of these diseases, it certainly seemed strange to some that no light could be thrown on the form and mode in which the parasites, especially of human malaria, existed outside of the body, and on the way in which they gained entrance into our bodies. A number of theories were advanced; it was assumed that the microphytes existed in the soil, air, or water of humid regions, multiplying freely in these elements; that they were carried by air currents and in mists and vapors, infecting persons through the air breathed or the water which they drank; and in not a few places it was thought that malaria stood in some close relation to the bite of mosquitoes and other insects.

The mosquito theory of malaria is not of recent origin by any means. It was held by ancient Roman writers whose clinical knowledge of malaria was very accurate and minute; Linné, Sir Henry Holland and others regarded the transmission of malaria by mosquitoes as quite probable; such was also and is to-day the popular belief of peasants in certain parts of Italy and Tyrol, and of barbarous tribes in malarial districts of Africa and elsewhere; and we find the same theory advanced in a scientific manner by such medical men as A. F. A. King and Nott of America, Laveran in France, Manson in England, Koch in Germany, Bignami, Grassi and others in Italy.

In his very complete and interesting review of the whole mosquito theory, Nuttall carefully considers the various general facts and arguments which King, Laveran and others have brought forward in its favor. King looked on such arguments, as he could present, not so much as proof of the correctness of the theory, but rather as incentives to experiments and observations which might lead to convincing discoveries. From the voluminous observations tending in a general way to support the mosquito theory the following features may be selected for mention: The seasonal and soil relations of malaria which prevail especially in moist and warm seasons and in

marshy regions—such as the deltas and courses of great rivers and also certain littorals—conditions which certainly greatly favor the development of mosquitoes and other insects; in malarial regions protection against the bite of mosquitoes also protects from malaria, as shown by the results of diverse measures employed by the inhabitants and of travelers through such regions; the decidedly favorable or anti-malarial influence of certain occupations, of cultivation of the soil and also of altitude, presumably the result of the prevention of the sting or of the total absence of the insects. Indeed, it is generally accepted by those who have especially studied the question that mosquitoes always occur where malaria prevails. Grassi, Ross and Koch expressly state that they have not seen malaria in regions free from mosquitoes. It goes without saying that mosquitoes often occur where there is no malaria—not all mosquitoes are necessarily carriers of infection.

The mosquito theory of malaria received powerful support by the demonstration, by Theobald Smith, that the hematozoon of Texas cattle fever is transmitted by the bite of the cattle tick (*Boophilus bovis*); Laveran, Koch and others emphasize that the mosquito probably plays an exactly analogous part in malaria. Based on his demonstration that the *filaria Bancrofti* passes part of its existence in the body of the mosquito, Patrick Manson in 1894 expounded the theory that the organisms of malaria also divide their existence between man and mosquito; arguing from the remarkable fact that the flagellate bodies in certain forms of malaria are not developed until the blood containing them has been outside of the body for some time. Manson drew the further conclusion in favor of his theory that the purpose of the flagellate bodies is the continuation of the life of the malarial parasite outside of the human body. Now the hematozoa cannot leave the blood-vessels spontaneously, hence the necessity for the presence and the operations of a suctorial insect. Manson, and also Laveran, believed that the human infection took place by way of drinking water infected by mosquitoes which had sucked up malarial blood and died after laying their eggs in the water, or by the inhalation of dust produced by the drying up of small pools and puddles which once contained infected water; furthermore, that human patients may introduce malaria by infecting the mosquitoes.

Manson's deductions were destined to exercise a decisive influence on this investigation because they pointed out the exact way in which some of the problems should be attacked in the actual and

crucial experiments which were undertaken with signal success by Ronald Ross, an English army surgeon in India. Shorn of all details the results of Ross' great work during the past three and a half years—1895-1899—may be summarized in the following statements: The "cultivation" of the parasites of human malaria in the bodies of two species of mosquitoes inoculated by being allowed to suck the blood of malarial patients; in the infected mosquito the parasites occurred as peculiar, pigmented cells in the walls of the stomach. Feeding mosquitoes on the blood of birds containing hematozoa (*Halteridium* and especially *Proteosoma*), he traced the formation in the walls of the stomach of large cells which fall asunder into spindle-shaped bodies—"germinal rods"—which are carried by the blood to the salivary glands, where they collect in huge numbers and whence they are discharged into the blood of healthy birds bitten by the infected mosquitoes. It required seven days or so after the infection of a mosquito before the germinal rods or sporozoites reach the salivary glands, and birds bitten by such mosquitoes fall sick five or six days afterward.

The development of the parasites in the body of the mosquito, as described by Ross, has been confirmed by such scientists as Manson, Laveran, Metchnikoff and Nuttall, who have all examined his specimens.

No sooner were Ross' observations made public than they were confirmed by the independent studies of those indefatigable students of malaria, the Italians, especially Grassi, Bastianelli and Bignami, whose researches in this direction have carried our knowledge of human malaria still further than Ross. They have succeeded in not only infecting persons with malaria through the bite of infected mosquitoes, but they have traced the whole development in the body of the insect of the crescent of the estivo-autumnal type and partly that of the tertian parasite. We are also told that they have found young parasites in the eggs of infected mosquitoes. Malarial parasites have also been found in a large percentage (75) of mosquitoes captured in rooms and localities inhabited by malarial patients.

It will be recalled that Manson and others thought that the infection of persons with malaria occurred through drinking of water or the inhalation of dust containing parasites derived from dead, infected mosquitoes. King and others believed that the bite of the mosquito gave rise to the infection. Koch doubted the direct transmission of malaria from person to person by way of the mosquito;

it did not seem likely to produce such a direct infection; if such should be assumed to be the case the disease would have to spread much more rapidly than it actually does—an argument which could now be met, if that were necessary, in the light of recent demonstrations, by the fact that there are many kinds of mosquitoes and that all do not carry malaria.

During their investigation, Ross, and more especially the Italians, have learned that not all kinds or species of mosquitoes act as hosts of the parasites. There are many species, and among them the common or domestic mosquito (Ross), which do not seem to bear any relation to any known hematozoon infection. The particular kinds of mosquito which can furnish the suitable conditions for the growth in their bodies of the organisms of human malaria belong largely to the genus *Anopheles,* of which there are many varieties. Whether other kinds of suctorial insects than mosquitoes can act as the carrier of human malaria has not yet been determined.

Different suggestions have also been made with respect to the modes in which mosquitoes might become infected. Bignami thought that possibly the insects picked up the parasites from the ground, but Dionisi, from his investigations, could find no facts in favor of this view. Mosquitoes eat each other's excrements and possibly become infected in this manner. Or the larvæ might become infected through eating the cadavers of the mothers. Evidence is accumulating, however, which tends to show that mosquitoes once infected by drawing blood, may perpetuate their infectiousness through succeeding generations by transmission of the parasites in a sort of sporing form to the eggs of the female. Grassi has observed spores in mosquito eggs (*Anopheles*) and it has been found that in Italy fertilized females may live through the winter, perhaps in this way preventing the dying out of the parasites.

In connection with this phase of the matter it is inter-résumé of the role of the ectoparasitic tick in Texas fever. In a recent paper, Theobald Smith gives a clear résumé of the role of the ectoparasitic tick in Texas fever, the devastating disease which recent studies have shown occurs in Finland, Roumania, Italy, Australia, South Africa and German East Africa. The permanently infected territory in our own country includes most of the Southern States. That ticks carry this disease was suspected long ago: as early as 1868 it was mentioned only to be condemned by John Gamgee.

Smith and Kilbourne have shown conclusively by their experiments that the tick carries the disease. The tick is exclusively parasitic in its habits and does not pass from one host to another. The fertilized female after a certain time drops dead to the ground and deposits one to two thousand eggs. After a varying time the embryos emerge, attach themselves to the host and begin a new life cycle. Now by placing animals in a pasture infected with the embryos of ticks from Texas fever cattle the development of the fever is observed to follow. Artificially hatched eggs of ticks from sick animals also produce the disease when the embryos are placed on healthy cattle. While the life history of the parasite in the tick has not yet been traced—the Texas parasite has not yet been found in the eggs of the tick—yet it is warranted to assume that the eggs carry the infection and that the young tick discharges the parasites into the host during the process of drawing blood. Smith assumes that partially immune cattle, in the blood of which the hematozoon may exist for years, under suitable states become the source of new centres of infection through the agency of the tick. Reasoning by analogy, Smith suggests that malaria may spread in a similar manner. Brought into a perhaps hitherto non-malarious district in the body of human beings suffering perchance from a chronic or mild infection, mosquitoes transmit the parasites to younger broods which again spread the infection among men. In temperate climates it is not unlikely that the parasite is protected over winter in the bodies of human individuals. Certainly the scattering of an infected brood of mosquitoes explains well what seems to happen in the newly malarious territory. Whether certain animals can harbor the malarial parasites of man is still undecided. Dionisi has found a hematozoon of the bat which resembles human varieties very much.

Reconstructing, in the light of the new facts, the developmental history of the malarial parasites, we find, as pointed out by the Italians, that human as well as animal parasites, or hematozoa, possess intermediate hosts and alternating sexual and non-sexual generations. The intermediate host is a warm-blooded animal, including man. The definitive host is an acarus (mite) or a diptera (mosquito, etc.). In the warm-blooded animals the parasites multiply rapidly by segmentation; temporarily unreproductive, sexual forms (crescents, flagellate bodies) are also formed, which copulate—probably as described in the case of certain hematozoa of birds, by

MacCallum—when they reach the stomach of the definite host; a sporoblastic form results, from which sporozoites arise, accumulate in the salivary glands of the hosts, when they are deposited in warm-blooded animals during the bite of the insects—a complicated yet simple cycle analogous to that of many other organisms requiring two hosts for their development: Tenia solium, Trichina spiralis, Filaria Bancrofti, Filaria recondita, the organisms of Texas fever and Tsetse fly disease. In the case of malarial organisms the insects are spoken of as definitive hosts because they harbor the higher stages of the development of the parasites.

The old mosquito theories of malaria are therefore to be considered as definitely verified by the results of recent experiment research. As a direct outcome of these new facts is to be noted the possibility of exterminating malaria from infected areas by preventing the development of dangerous mosquitoes, as advocated by Ross. He points out that the harmful insects in a given locality may be detected by ascertaining, according to Manson's induction method, whether the parasites of malaria will live in them or not: that the breeding ground—small bodies of water—can be found by searching for their larvæ, which have distinguishing characteristics; if these spots are sufficiently isolated and rare it is possible that the mosquitoes could be exterminated by filling up or draining the pools and plashes, or by the use of certain chemicals, such as kerosene, which has been found quite efficacious in preliminary experiments. In the northern parts of the United States it is likely, as emphasized by Smith, that the prevention of stagnation of surface water would tend to hinder the springing up of the small foci of malaria noticed every now and then. It seems that war is about to be declared against the vexatious mosquitoes.—"Journal American Medical Association," August 12, 1899.

ADVANTAGE OF SPECTACLES.—Dr. Franklin always wore spectacles. One day, on Ludgate Hill, a porter passing him was nearly pushed off the pavement by an unintentional motion of the doctor. The fellow, with characteristic insolence, exclaimed, "Damn your spectacles!" Franklin, smiling, observed, "It is not the first time they have *saved my eyes.*"

MEDICAL EXCERPT.

By T. P. Corbally, A. M., M. D.

Fracture of Scull in Utero.—Dr. Gonzales Alvarez presented to the Academia de Medicina de Madrid (Revista de Medicina y Cirugia, No. 560) report of a case of fracture of the cranium in a fetus a month before its birth.

The accouchement was entirely normal and a healthy child was born at term having a fracture of the occipital bone and a wound of the pericraneum, torn by a splinter of the broken bone. All parts of the injury were at the time of birth in an advanced state of recovery. At the edge of the lacerated wound a clot of coagulated blood was found adhering to the scalp, and a vein in the neighborhood was greatly dilated, no doubt to supply the circulation obstructed by the cicatrization of the fracture.

The fracture must have taken place a month before the delivery of the child; the mother about that time had a severe fall forwards. To avoid a serious injury she violently flexed the thorax on the pelvis so that the scull of the fetus was pressed violently against the spine of the pelvis and thus no doubt caused the fracture.

Such cases are very important in consequence of the judicial consequences that may follow and therefore they deserve to be studied carefully in their medico-legal bearings.

Impaludism and Sulfate of Quinine.—M. Theille protests strongly against the idea that is now formed regarding paludism and its inconsiderate use, as he thinks, as a preventive of or cure for the infection. He summarizes his view in the following propositions:

1st. There is really but one kind of fever that is benefited by the sulfate of quinine, that is the perfect intermittent fever—*febris intermittens exquisita*—of the ancients, comparatively rare, very disagreeable, but entirely free from fatal results.

2d. The true intermittent is never changed into the pernicious, never creates the megalosplenic, the paludian cachexy, its duration lasts but a year; if it be left to itself, as Hippocrates has said. It is the fever of the soil, the alluvial, appearing only during a certain limited part of the year. It attacks the individual but once, consequently conferring immunity.

3d. The other diseases that have, up to the present, constituted the classic paludism, the continuous fever, that of parasitic origin, the cachexia called paludism, the pernicious type are not the diseases that require quinine, whence the persistence of the disease, the development of complications in the patients who are gorged with sulfate of quinine, which in time gives rise to the pretense that the patient becomes habituated to the medicine.

4th. The fever is *a priori* a negligible quantity among diseases from a therapeutic point of view; we can act only on the perfect intermittent with quinine.

5th. There is only one law governing the action of sulfate of quinine: that which I described in 1891 and formulated thus: In the perfect fever, the medicine given in the beginning of the attack in single doses appropriate to the type, does not in any way influence the attack but always cuts short the consequences for five days at least.

Ulcers of the Legs.—MM. Fournier and Lacapère reported to the Société de Dermatalogie et de Syphligraphie (La France Médicale, 4th of August) the case of a patient, 30 years of age, attacked when a child of five years with ulcers of the inner surface of the lower part of the legs. These ulcers have been generally considered as varicose; they have healed from time to time and reappeared either spontaneously or as the result of injuries. However there is no trace whatever of varicose veins. There is no syphilitic taint either hereditary or acquired. A general examination of the patient shows that he is suffering with architis, inactive liver and in the beginning pulmonary bacilli. There is also an Addisonian discoloration of the skin and a megalosplenia without hyperglobulia and with slight leucocytosis.

Here it might be supposed that there had been a primary bacillary inoculation through the legs with successive swarms in the different organs, as the testicle, the liver, the lungs, the suprarenal capsules, the spleen, resembling the case of megalosplenia described recently by M. Widal.

MM. Hallopeau and Lévi presented the viscera of a patient attacked with melanic sarcomas that had been exhibited before. The neoplasms increased rapidly in the lungs, the kidneys, the brain, the different ganglions, only a part of which were melanic; this fact shows that the coloring matter has not, as might be sup-

posed, *a priori* the essential role in the genesis of the disease, and that it is due, from all appearance, to the active nutrition of their parasitic elements exerted in certain organs of the body.

LA GRIPPE.—SOME OF ITS COMPLICATIONS AND TREATMENT.—Prof. Grube, Toledo Medical College (Journal of American Medical Association, March 25, 1899), sees no reason why the intelligent observer need err in his diagnosis of la grippe. He believes that the intensity of the catarrhal symptoms, the great prostration, and tardy convalescence form a typic clinical picture. Though the catarrhal symptoms are usually limited to the respiratory mucous membrane they are not always so.

Perhaps the most common complication in children is the middle-ear inflammation caused by extension of the pharyngeal catarrh up the Eustachian tube into the tympanum. He cites several such cases, in some of which suppuration occurred. The most effectual treatment in these cases was as follows:

After suppuration occurred, the canal was cleansel by Hydrozone solution (warm), and a piece of absorbent cotton saturated with Glycozone used as a dressing by inserting it into the canal. In the case of a prominent city official who had an unusually severe attack, all the structures of the nasal cavities were involved in a severe acute catarrh, which progressed to the stage of suppuration. Enormous quantities of pus were secreted, and the location and intensity of the pain led him to fear involvement of the antrum. However, the free use of Hydrozone solution by spraying, and the application of Glycozone, soon cleared up the cavity, and in a few days complete cure resulted.

REPORTED BIRTH OF SEVEN CHILDREN.—The report comes from Brownsville, Pa., to the effect that Mrs. George Hackett, colored, gave birth a few days ago to seven children, four girls and three boys. They were all alive when born, but all died within a few hours but one. The reports say they were small, but well formed. The parents are poor, the father being a miner, and about twenty-five years old. The mother had two children before giving birth to these. She is said to be doing well, and the one child will probably live.—"Medical News," August 5, 1899.

EDITOR'S TABLE.

SANITARIAN, OCTOBER, 1899.

☞All correspondence and exchanges, and all publications for review, should be addressed to the Editor, Dr. A. N. Bell, Brooklyn, N. Y.

STATE SCHOOL OF PUBLIC HEALTH.

As the first step toward the establishment of a State School of Public Health the Council of New York University has arranged for five short special technical courses of instruction for health officers to be given this season. The courses are planned to occupy about six weeks each, but it is probable that two or more of the courses can be taken at the same time. Two of them are concerned with bacteriology, the elementary course consisting chiefly of practical exercises in the laboratory, with an occasional informal lecture explaining the underlying principles and their application to the needs of health boards. These subjects will be taken up in this course:

The preparation of culture media, the sterilization of apparatus and media, the methods of separating different species of bacteria from mixtures, the isolation and study of the biological characteristics of selected species of bacteria, the various methods of staining and making permanent preparations of bacteria, the general characters of yeasts and molds, the methods of testing the value of germicides.

An effort was made last winter by the University Council to get the support of the State in establishing a School of Public Health on a large and comprehensive plan. A bill providing for an appropriation of $25,000 for equipment and $25,000 annually for expenses passed the Assembly, but failed in the Senate. The university offered to give the ground and buildings, value $100,000, on the condition that the State would make the appropriation named in the bill.

The council has not decided what move to make next, but it has not abandoned its hope of a State School, and in all probability the matter will be urged upon the Legislature again this winter.

THE EUCALYPTUS.

We are gratified to learn that General Brooke has had his attention called to the anti-malarial properties of the Eucalyptus,

with a view to its planting in the swampy lands of Cuba. Sir Thomas Mitchell, who made the first scientific exploration of Australia, forty years ago, described the wonderful marsh-drying properties of Eucalyptus trees which suggested their anti-malarial effects, and the subsequent extensive use in other countries.

General Brooke has had his attention called to the success obtained in cultivating the tree in the vast Campagna di Roma, Italy, where the Eucalyptus is now recognized as rendering the whole territory much less unhealthful. The city of Mexico is cited as another instance where the Vigo canal, the floating gardens and other malarial districts are now well stocked with young trees, with the result that the places which were once marshy and unhealthful have been rendered dry and innocuous.

One recommendation says that the camp of the British troops in Jamaica, which was formerly malarial, has been planted with Eucalyptus, the outcome already being a steady disappearance of marshy spots. The tree, which absorbs the moisture, grows very rapidly, often ten feet in a year. The wood is valuable and honey bees seek the flowers. The honey, it is said, contains important medicinal properties.

The tree department at Santiago de Cuba, not knowing of the investigations in progress under General Brooke's direction, recently made a request for several thousands of Eucalyptus plants, the requisition being strongly indorsed by General Leonard Wood.

The officials in charge of the yellow fever hospital planted several scions some months ago, and these are now thriving. It is believed that great good will result from the investigations.

Every reader of THE SANITARIAN for any considerable period is familiar with the salutary results from the cultivation of Eucalyptus trees in malarial regions, so thoroughly verified twenty-three years ago (Vol. IV.) as to have led to the adoption of the emblem which embellishes the cover—the American eagle, bearing in its talons the Eucalyptus, the greatest of sanitary plants, and the Poppy, a veritable *regium donum* from the King of Kings to the human race.

In a Latin poem by Landor, Ceres is said to have created the Poppy to assuage her anguish during the search for her lost daughter; hence, in the language of flowers, the significance of the Red Poppy is consolation. The scroll held in the eagle's bill speaks for itself.

ARMY SANITARIUM AT FORT BAYARD, N. M.

By direction of the Secretary of War, the Surgeon General of the Army has been authorized to establish a general hospital at Fort Bayard, New Mexico, as a sanitarium for the treatment of officers and enlisted men of the Army suffering from pulmonary tuberculosis, and hereafter transfers of enlisted men suffering from this disease may be made to this hospital upon the recommendation of medical officers of the Army (to be forwarded through military channels).

Such buildings pertaining to the post of Fort Bayard as may be necessary to carry this order into effect will be designated by the Surgeon General of the Army. Fort Bayard will be put in good state of repair by the Quartermaster's Department.

The Surgeon General is also authorized to provide for the care and treatment of discharged soldiers entitled to the benefits of the U. S. Soldiers' Home, Washington, District of Columbia, who may be sent to the sanitarium by the Board of Commissioners of the Home. The expense for the maintenance of such discharged soldiers to be paid from the Soldiers' Home funds.

A CLIMATOLOGICAL LABORATORY.

Through the generosity of Mrs. W. C. Hadley and the citizens of Albuquerque, a $20,000 laboratory is now in process of construction there, in connection with the University of New Mexico, for the investigation of climatological problems, especially as related to tuberculosis. The institution is for memorial of the late W. C. Hadley, who spent a number of years in New Mexico for his health, and finally died of tuberculosis. One purpose of the laboratory will be to determine scientifically the various elements that characterize the climate of New Mexico.

NO RIGHT TO POLLUTE STREAMS.

The right to pollute the waters of a running stream by discharging sewage into it was recently asserted—and in the first instance sustained by a court—in a suit which has attracted a good deal of attention in Pennsylvania on account of the bearing of the decision upon the pollution of the Schuylkill River, from which Philadelphia derives its water supply.

George P. Yost of Glen Rock, Pa., constructed a drain which discharged sewage into a stream which supplied the city of York with drinking water. The State Board of Health caused him to be sued for maintaining a nuisance, and the Trial Court decided

in his favor on the ground that the inhabitants of the district through which the stream flowed were entitled to use it as a common and public sewer. But the Superior Court, on appeal, decided otherwise: "No prescription or usage," says Judge Orlady, speaking for that tribunal, "can justify the pollution of a stream by the discharge of sewage in such a manner as to be injurious to the public health." There is a distance of twelve miles between the mouth of the drain and the city pumping station, but the evidence showed that an increase of typhoid fever at York speedily followed an outbreak of that disease at Glen Rock. The germs of typhoid fever are transmissible by running water more than twice twelve miles.

THE DESTRUCTION OF MOSQUITOES WITH KEROSENE.—Mr. Howard, of the United States Department of Agriculture, proposes to destroy those vexatious vehicles of malaria, mosquitoes, by sprinkling kerosene oil over their breeding ponds. The "British Med. Jour." reports an interesting experiment along this line. Four drops of kerosene added to a bucket of water containing four or five hundred larvæ killed them all in an hour, and a teaspoonful killed within a few hours the many thousand contained in a large water-tank.

WATER FILTERS FOR CHINA.—Under date of Chefoo, April 22, 1899, Consul Fowler writes as follows:

"When in Port Arthur last November, I noticed the soldiers drinking out of large jars, or kongs, water which was unfiltered and certainly dangerous. It occurred to me that if American manufacturers could sell a good cheap filter, or, better still, small condensers for condensing either fresh or salt water, an immense market would be opened to them, not only among the Russian troops, but among the British at Weihaiwei and the Germans at Kyao-chau, not to mention foreigners and even Chinese elsewhere in this Empire, who now depend upon muddy river or rain water for all purposes."

YELLOW FEVER—THE SPECIFIC GERM.

Is Sanarelli's bacillus icteroides identical with bacillus choleræ suis (the bacillus of hog cholera)? It evidently so appears (Medical News, Sept. 9, 1899) at the present stage of the controversy between Prof. Sanarelli and Surgeon-General Sternberg.

But while this controversy is still in progress, the Commission consisting of Surgeons Eugene Wasdin and H. D. Giddings, ap-

pointed by the President in November, 1897, and has since been prosecuting its investigation in the laboratory of the Marine-Hospital Service in Havana, has submitted a conclusive report (U. S. Public Health Reports, Vol. XIV, No. 33), sustaining Sanarelli's claim. The subjects of study were twenty-two cases of disease thought to be yellow fever by the native physicians in attendance, and in fourteen of which the commission concurred in the diagnosis. The conclusions derived from the investigation are:

"(1) That the micro-organism discovered by Prof. Giuseppe Sanarelli, of the University of Bologna, Italy, and by him named 'bacillus icteroides,' is the cause of yellow fever.

"(2) That yellow fever is naturally infectious to certain animals, the degree varying with the species; that in some rodents local infection is very quickly followed by blood infection; and that, while in dogs and rabbits there is no evidence of its subsequent invasion of the blood, monkeys react to the infection the same as man.

"(3) That infection takes place by way of the respiratory tract, the primary colonization in this tract giving rise to the earlier manifestations of the disease.

"(4) That in many cases of the disease, probably a majority, the primary infection or colonization in the lungs is followed by a 'secondary infection' or a secondary colonization of this organism in the blood of the patient. This secondary infection may be complicated by the coinstantaneous passage of other organisms into the blood, or this complication may arise during the last hours of life.

"(5) That there is no evidence to support the theory advanced by Professor Sanarelli that this disease is primarily a septicemia, inasmuch as cases do occur in which the bacillus icteroides cannot be found in the blood or organs in which it might be deposited therefrom.

"(6) That there exists no causal relationship between the bacillus *x* of Sternberg and this highly infectious disease, and that the bacillus *x* is frequently found in the intestinal content of normal animals and of man, as well as in the urine and the bronchial secretion.

"(7) That, so far as your commission is aware, the bacillus icteroides has never been found in any body other than one infected with yellow fever, and that whatever may be the cultural similarities between this and other micro-organisms, it is characterized by a specificity which is distinctive.

"(8) That the bacillus icteroides is very susceptible to the influences injurious to bacterial life; and that its ready control by the processes of disinfection, chemical and mechanical, is assured.

"(9) That the bacillus icteroides produces *in vitro,* as well as *in vita,* a toxin of the most marked potency; and that, from our present knowledge, there exists a reasonable possibility of the ultimate production of an antiserum more potent than that of Professor Sanarelli."

The recent outbreaks of yellow fever in Florida and Mississippi, and at New Orleans, as reported below, seem to sustain Sanarelli's contention for the temperature-resisting power and seasonal revival of the germs under favorable local conditions. At any rate no evidence of recent importation has been as yet adduced.

MORTALITY AND MORBILITY REPORTS AND REVIEWS.

NEW YORK, 7,110,000. State Board bulletin for July reports the average number of deaths in this month for the past ten years 11,920, ranging from 10,800 in 1889, to 13,550 in 1892. For the same period the average monthly mortality for the rest of the year was 9,615, July being always the month of largest mortality in the year in this State. There has been reported for the present month 11,291 deaths, which is below the average by about 600. The number is slightly less than that of July, 1898.

There were 1,800 more deaths than in the preceding month of June, and the death rate has risen from 16.0 per 1,000 population annually, to 18.7; there were 50 more deaths daily. Deaths under five years of age, 4,819, against 3,100 in June, so that the increase in mortality was almost wholly infantile—42.6 per cent of the total deaths; unusually low since the proportion has been nearly 50.0 per cent for the past ten years. It has diminished both relatively and actually during much of that period; in July, 1892, there were 6,855 deaths under five years of age, which was 52.0 per cent of the total, since then there having been a decrease yearly and the present mortality of 4,819 is the lowest of any year on our records for July. The infant mortality is high in those health districts having large city populations, more than half of the deaths in the Maritime occurring in early life and but 11.2 per cent in the West Central district.

The *zymotic mortality* likewise varied with the density of population, chiefly on account of the deaths from *diarrhœal diseases,*

which caused all but about 600 of the 2,700 deaths from these causes. The diarrhœal mortality was relatively highest in the Lake Ontario and Western district, where nearly one-fourth of all deaths were from this cause; in the Maritime district, one-fifth; while in the Southern Tier district only one-twentieth of the deaths were diarrhœal.

There were 645 deaths from *accidents and violence;* a number from various localities were from tetanus, due sometimes to toy pistols and fire-crackers, there were two deaths from lightning stroke and many from drowning. Past years show more accidental deaths in July than in any other month.

City of New York, 3,550,053: Total deaths, 6,808; annual death rate, 22.6; from cerebro-spinal meningitis, 38; typhoid fever, 44; scarlatina, 29; measles, 52; erysipelas, 17; whooping-cough, 66; diphtheria, 158; diarrhœal diseases, 1,358; consumption, 659.

Borough of Manhattan, 1,953,569: Total deaths, 3,571; death rate, 21.0; from cerebro-spinal meningitis, 27; typhoid fever 21; diphtheria, 75; phthisis, 338; percentage of deaths under 5 years of age, 51.6.

Borough of the Bronx, 163,537: Total deaths, 397; death rate, 28.5; from smallpox, 1; diphtheria, 7; diarrhœal diseases, 80. Many large institutions raise the death rate.

Borough of Brooklyn, 1,231,548: Total deaths, 2,381; death rate, 22.5; from typhoid fever, 22; diphtheria, 72; phthisis, 214; diarrhœal diseases, 577; percentage of deaths under 5, 53.1.

Borough of Queens, 134,139: Total deaths, 295; death rate, 25.8; from diphtheria, 4; phthisis, 17; percentage of deaths under 5, 55.2.

Borough of Richmond, 67,260: Total deaths, 164; death rate, 28.7; from phthisis, 12; percentage of deaths under 5, 49.4.

Albany, 100,000: Total deaths, 156; death rate, 18.4; from typhoid fever, 2; diphtheria, 3; diarrhœal diseases, 14; phthisis, 15. The "Times-Union" of Aug. 2 reports the filtering plant now far advanced.

Troy, 65,000: Total deaths, 134; death rate, 24.3; from typhoid fever, 2; diarrhœal diseases, 39; phthisis, 21.

Utica, 55,000: Total deaths, 73; death rate, 15.8; from diarrhœal diseases, 5; phthisis, 6.

Syracuse, 120,000: Total deaths, 123; death rate, 12.1; from typhoid fever, 1; diarrhœal diseases, 28; phthisis, 9.

Buffalo, 360,000: Total deaths, 486; death rate, 15.9; from typhoid fever, 5; diphtheria, 5; diarrhœal diseases, 158; phthisis, 40.

Rochester, 175,000: Total deaths, 229; death rate, 15.4; from diarrhœal diseases, 51; diphtheria, 3; phthisis, 20.

Yonkers, 42,000: Total deaths, 87; death rate, 29.3; from diarrhœal diseases, 31; phthisis, 8.

Cohoes, 25,000: Total deaths, 37; death rate, 17.5; from diarrhœal diseases, 11; phthisis, 3.

Kingston, 25,000: Total deaths, 47; death rate, 21.0; from diarrhœal diseases, 10.

Poughkeepsie, 25,000: Total deaths, 35; death rate, 16.5; from diarrhœal diseases, 4; phthisis, 1.

Newburgh, 36,000: Total deaths, 37; death rate, 12.2; from diarrhœal diseases, 6; phthisis, 7.

Schenectady, 28,791: Total deaths, 35; death rate, 14.1; from diarrhœal diseases, 12.

Binghamton, 45,000: Total deaths, 54; death rate, 14.0; from diarrhœal diseases, 4; phthisis, 4.

Elmira, 40,000: Total deaths, 37; death rate, 11.0; from diarrhœal diseases, 5; phthisis, 2.

Oswego, 22,000: Total deaths, 22; death rate, 12.0; from diarrhœal diseases, 5.

CALIFORNIA.—San Francisco, 360,000, July, 99: Total deaths, 518; death rate, 17.26; from typhoid fever, 16; diphtheria, 5; smallpox, 5; consumption, 63.

Los Angeles, 103,000, July, '99: Total deaths, 92; death rate, 10.71; from typhoid fever, 4; cerebro-spinal meningitis, 4; consumption, 14—9 had lived here less than 10 years.

CONNECTICUT.—The Secretary of the State Board sums up 168 towns, 912,159, July, '99: Total deaths, 1,369, 321 more than reported in June, and 144 more than in July of last year, and 16 more than the average number of deaths in July for the five years preceding the present. The death rate was 18.9 for the large towns; for the small towns 15.1, and for the whole State 18.0. The deaths from zymotic diseases were 504, being 36.8 per cent of the total mortality.

DISTRICT OF COLUMBIA.—287,462—87,030 colored, 5 weeks, Sept. 2, '99: Total deaths 551; death rates, white, 14.78; colored, 31.32: 19.9; deaths from zymotic diseases, 143—typhoid fever, 40; phthisis, 62.

FLORIDA.—Key West, Sept. 13.—Thirty-five cases of *yellow fever* reported in the past twenty-four hours; total to date, 253 cases. First case reported August 31; total deaths to date 12. Cases have been reported at Miami and Port Tampa.

ILLINOIS.—Chicago, 1,650,000—23,000 colored; Total deaths from all causes in July, 2,360—48 colored. Annual death date: white, 14.88; colored, 28.30: 15.00; deaths from diphtheria, 47; typhoid fever, 41; scarlet fever, 20; measles, 19; whooping-cough, 10; consumption, 198.

Influenza.—Since the last great pandemic of influenza—which resulted, as to Chicago, in the epidemic of 1891-92—there has been no period altogether free from the disease, and in this city it appears to have become permanently domesticated. In 1891 there were 336 deaths from influenza reported to the Department; in 1892 there were 103; 88 in 1893; 51 in 1894; 165 in 1895; 17 in 1896; 15 in 1897; 281 in 1898: and 304 up to the close of July, 1899.

Fifty per cent. of the total deaths from influenza as the chief cause were among persons over sixty years of age and twenty-two per cent. of the total were of persons between seventy and eighty years old.

IOWA.—State Board bulletin reports outbreaks of infectious diseases during the month of July as follows: Cerebro-spinal meningitis, Monona; Cedar Rapids; Davenport; Emmetsburg. Diphtheria, Colfax; Amsterdam township, Hancock county; Ottumwa. Scarlet fever, Holmes; West Liberty; Fulton township, Muscatine county; Corning; Lake township, Wright county; Coldwater township, Butler county; Bennett; Dawson township, Greene county; Washta; Eldon. Typhoid fever, Franklin; Des Moines; Marshalltown; Nevada; Ottumwa.

Fifteen cities with an aggregate population of 254,500: Total deaths, 218; annual death rate per 1,000, 10.3.

LOUISIANA.—New Orleans, 300,000—90,000 colored—July, '99: Total deaths, 604—244 colored; death rates, white, 20.57; colored, 32.52: 24.16. Deaths from phthisis, 71; typho-malarial fever, 8; typhoid fever, 16.

September 13.—Yellow fever, no new cases reported to 4 o'clock to-day; seven cases, with one death, since August 30.

MARYLAND.—Baltimore, 541,000—78,000 colored, July, '99: Total deaths, 1,032—226 colored; annual death rates, white, 20.89;

colored, 34.77: 22.51. Deaths from infectious diseases, 33; diphtheria, 15; consumption, 72; 543, or 52.61 per cent. of the total deaths were of children under five years of age.

MASSACHUSETTS.—Boston, 541,827, July, '99: Total deaths 967—death rate, 21.42; from diphtheria and croup, 26; typhoid fever, 14; cerebro-spinal fever, 7; cholera infantum, 130; consumption, 102.

Recent statistics given out by Dr. Abbott, Secretary of the State Board of Health, show that, as the result of improved sanitary conditions in the State, diseases are getting less dangerous, if not indeed less numerous. There were fewer deaths in 1898 from infectious diseases, by 1,263, than during the previous year, though the population in the meantime increased from about 2,610,000 to about 2,665,000. The number of deaths from diphtheria decreased one-half, scarlet fever more than one-half, the deaths from consumption were about 5 per cent. fewer, and there were only about half as many deaths from measles as in the former year. The death rate was reduced to 18 per 1,000, whereas it had been at about 19 for half a century. There was a slight increase in the number of deaths from certain diseases, including typhoid fever, whooping cough and cholera infantum. Dr. Abbott attributes this decrease in the death rate to various causes, such as improved sanitary conditions, stricter quarantine regulations and a better system of hygiene.

Cases of infectious diseases reported during the month: Diphtheria, 235; measles, 166; scarlatina, 70; typhoid fever, 63; smallpox, 2.

MICHIGAN.—The Secretary of the State Board reports for August, '99: As compared with the preceding month, cholera infantum, typhoid fever, dysentery, cholera morbus, diarrhea and remittent fever increased, and scarlet fever, measles and inflammation of kidneys decreased in area of prevalence. Compared with the average for August in the 13 years, 1886-98, diphtheria, whooping cough, pneumonia, scarlet fever, intermittent fever, remittent fever, consumption, cholera morbus, erysipelas and typhoid fever were less prevalent.

Deaths reported for the month from the office of the Secretary of State, 2,755; death rate, 13.8; 356 more than for the preceding month; also about 300 more for the month of August, 1898; 703 of the details were of infants under 1 year of age, and 296 from 1 to 4 years of age, a marked increase, due to the prevalence of

diarrheal diseases, from which cause there were 501 deaths reported, as compared with 265 in July. Deaths from pulmonary consumption, 145; other tubercular diseases, 53; typhoid fever, 50; diphtheria and croup, 22; scarlet fever, 9; measles, 7; whooping cough, 34; pneumonia, 82; diarrheal diseases, under 5 years, 501; cerebro-spinal meningitis, 45; cancer, 112; accidents and violence, 193.

There is no marked increase in mortality from any other cause than diarrheal diseases, with the exception of slight rises of typhoid fever and whooping cough.

MINNESOTA.—Minneapolis, 225,602; July, '99: Total deaths, 160; death rate, 9.29; from from zymotic diseases, 32; pthisis, 18.

St. Paul, 200,000, July, '99: Total deaths, 145; death rate, 8.70; from zymotic diseases, 4; phthisis, 22.

MISSISSIPPI.—Yellow fever was reported in Mississippi City about September 1. September 6 Dr. Murray, of Marine Hospital Service, who arrived there that morning, reported that there had been 13 cases of a mild variety, rendering it impossible for several days to get a diagnosis. Only one case with typical symptoms. September 10 a case was reported in Jackson—had been ill five days. And just as this sheet is closed, September 15, a case is reported at Pass Christian.

MISSOURI.—St. Louis, 623,000, July, '99: Total deaths, 826; death rate, 15.84; from typhoid fever, 9; diphtheria, 11; infantile diarrhea, 122; cerebro-spinal fever, 5; phthisis, 89.

NEW JERSEY.—Newark, 240,000; 6 weeks, Sept. 2, '99: Total deaths, 473: death rate, 17.95; from infectious diseases, 90; phthisis, 65.

Paterson, 115,944, July, '99: Total deaths, 215; death rate, 18.46: from zymotic diseases, 83; typhoid fever, 4; phthisis, 16.

NORTH CAROLINA.—Twenty-one towns, population 150,853—62,475 colored, report for July, '99, 205 deaths, 106 colored; death rates, white, 13.4; colored, 20.04: 16.3; deaths from consumption, 24; diarrheal diseases, 30; malarial fever, 8; typhoid fever, 8: deaths under 5 years of age, 83.

OHIO.—Cincinnati, 405,000: Deaths reported for July, '99, 459; death rate, 13.6: deaths from zymotic diseases, 62; from phthisis, 53: under five years of age, 162.

Cleveland, 395,000, July, '99: Total deaths, 523; death rate, 15.88: from zymotic diseases, 15; typhoid fever, 7; phthisis, (9.

tuberculosis, 22), 31. Annual report 1898: Total number of deaths, 5,040, as against 5,007, 1897, and death rate, 13.62, as against 14.3. Deaths under five years of age, 1892: From fevers, 376—121 typhoid; diphtheria (and membraneous croup), 146; phthisis, (192 and tuberculosis 247): 449, 8.09 per cent. of the total mortality.

PENNSYLVANIA.—Philadelphia, 1,266,832, 5 weeks, Aug. 26, '99: Total deaths, 2,141; from typhoid fever, 40; diphtheria, 65; phthisis, 220.

Pittsburg, 305,000, 4 weeks, Aug. 26, '99: Total deaths, 448; death rate, 19.05; from typhoid fever, 34; phthisis, 31.

SOUTH CAROLINA.—Charleston, 65,165—36,295 colored, 4 weeks, Sept. 2, '99: Total deaths, 136—97 colored; death rates, white, 17.56; colored, 34.63: 26.09.

WASHINGTON.—Seattle, 75,000, July, '99: Total deaths, 36; death rate, 5.44; from phthisis, 5.

WISCONSIN, Sept. 5: The State Board of Health receives reports from 1,300 local boards of health as to contagious diseases and latest reports show a fairly favorable condition of affairs. In the month of July there were 388 cases of contagious diseases and 67 deaths. The August reports show 347 cases and 73 deaths. Dr. Wingate says this is a low death rate from contagious diseases in a large State like Wisconsin. The August report is not yet compiled. The July report shows a larger death rate from measles than from scarlet fever. There were in Wisconsin July 112 cases of measles of 12 deaths, 83 cases of diphtheria and 13 deaths; 111 cases of scarlet fever and 2 deaths; 42 cases of typhoid fever and 5 deaths; 19 cases of whooping cough and 2 deaths. The number of deaths from consumption was 33, the number of cases not being reported.

Milwaukee, 285,000, July, '99: Total deaths, 346; death rate, 14.32: from typhoid fever, 3; diphtheria, 4; phthisis, 24; other tubercular diseases, 12.

CUBA.—Havana, Sept. 9.—The health statistics for the month of August, which have just been issued, show that during the month there were 11 deaths from yellow fever, 76 from dysentery, 65 from consumption, 54 from heart disease and 41 from other causes.

DANGER OF EPIDEMICS IN PORTO RICO.—Owing to the appalling loss of life from the storm in Porto Rico, the sanitary condition of the island is thought to be in a dangerous state and an epidemic of disease is feared.

BOOK REVIEWS.

POTABLE WATER AND METHODS OF DETECTING IMPURITIES.—By M. N. Baker, Ph. D., C. E., Associate Editor "Engineering News," Editor "The Manual of American Water Works." Price 50 cents. New York: D. Van Nostrand Co.

This is a small book on a most important subject to all persons interested in personal or public health (and who is not?) so concisely and yet so lucidly comprehending all of the essentials of the subject as to render them clearly intelligible even to readers unaccustomed to scientific literature. It describes the distinctive qualities of pure water, tells how it may be secured and how to detect impurities, and refers to some of the most notable American water laboratories. No matter how extensive one's knowledge may be on other subjects, he is untrustworthy for the care of his own health or the health of anybody else without knowledge of the danger of impure drinking water and its characteristics. We earnestly commend this book as a valuable contribution to such knowledge.

THE HYGIENE OF TRANSMISSIBLE DISEASES.—Their Causation, Modes of Dissemination and Methods of Prevention. By A. C. ABBOTT, M.D., Professor of Hygiene and Bacteriology, and Director of the Laboratory of Hygiene, University of Pennsylvania. Illustrated. 8vo pp. 311. Price $2.00 net. Philadelphia: W. B. Saunders.

This is a practical work of primary importance to all sanitarians —the gist of bacteriological knowledge to date—applied to preventable diseases. In this respect it is an elaborate abstract of hygiene, and the sum of all that is certainly known of the nature, conditions of existence and preventability of transmissible diseases to date. The work is divided into four parts. 1. The causation of disease, predisposing and exciting causes—age, sex, race, occupation, density of population, heredity, season; chemical, physical and mechanical and vital causes—these last with reference to parasites and bacteria. The second part takes up the subject-title of the book particularly, elaborately subdivided into brief sections on the transmissible diseases severally. 3. Prophylaxis in general —vital processes: immunity, vaccination and protective inocula-

tion, antitoxic condition; chemical and physical prophylactic measures; disinfection. 4. Management of communicable diseases; isolation, sick room, clothing, excreta, room disinfection, care of the body after death. And a concluding chapter on quarantine: in which reference made to English practice "to eliminate entirely the enforced detention," is a mistake. Recent English practice (since 1896) is the elimination of the word "quarantine" only, the segregation of cases of infectious diseases; restrictive measures against infected vessels and merchandise, and the landing of persons recently exposed to or ill with infectious diseases, are almost identical with the regulations of the United States Marine Hospital service. Excepting this error, the work is commendable to all practical sanitarians.

VACCINATION. Its Natural History and Pathology. Being the Milroy Lectures for 1898 delivered before the Royal College of Physicians of London. By S. MONCKTON COPEMAN, M.A., M.D., Cantab., M. R. C. P., London; Medical Inspector to Her Majesty's Local Government Board; Lecturer on Public Health in the Medical School of Westminster Hospital; Foreign Secretary and Member of Council of the Epidemiological Society of London, etc., etc. Illustrated. pp. 267. London and New York: The Macmillan Company.

A thorough up-to-date treatise, beginning with the history of smallpox from the first recorded knowledge of it, in the sixth century of the Christian Era, citing some of its most devastating epidemics in England and other countries during the Middle Ages, and up to and inclusive of the eighteenth century, in contrast with the mitigation of the disease that immediately followed—and has ever since continued to follow—vaccination since the beginning of the nineteenth century proportionally with the extent of its practice. But it is remarked, with reference to its previous prevalence, that "at any given date the great bulk of the people had already had smallpox, and it was only among a fraction that there was room for the disease to spread. Yet it was among such fractions of population that smallpox every few years slew its thousands in London alone. If we desire to obtain an illustration of the full effects of an invasion of smallpox, when not thus hampered by a very general immunity, the result of former epidemics, we must turn our attention to some particular locality which, owing to its isolated position, has previously escaped invasion. In

illustration of this point, we may take the case of Iceland, where during 1707-1709, out of a total population of 50,000, no less than 18,000 persons died of the disease." Next follows a sketch of inoculation, of which it is said there can be little doubt of its practice in China long ago, apparently before smallpox had obtained recognition in Europe; but the process was essentially different from inoculation properly so called, consisting as it did of inserting smallpox crusts into the nostrils of the patient whereby the disease was communicated by way of the respiratory track. As introduced in England through the instrumentality of Lady Mary Wortley Montagu in 1721, who derived her knowledge of the process of "engrafting" from Turkish operators, which is described, it was practiced until 1840, when on the passage of the first Vaccination Act it was prohibited by law.

The story of Jenner's discovery and investigations is admirably told, ending with reference to the definite pronouncement in 1896 of the Royal Commission on Vaccination, fully justifying the principle of Jenner as to the prophylactic power of vaccination. Then follows, beginning with the pathology of vaccinia, the century's scientific investigation of vaccination in all of its bearings: the relation of variola to vaccinia, history of various lymph stocks, histology of the vaccine vesicle, bacteriology, variola and vaccinia in the monkey, antitoxin, animal vaccination, glycerenated lymph, preparation and storage of glycerenated lymph, bacteriology of vaccine lymph: altogether, the most thorough investigation of vaccination and its benefits and the best guide to its practice hitherto published.

TRANSACTIONS OF THE MEDICAL SOCIETY OF THE STATE OF NEW YORK, 1899. 8vo. pp. 540. Published by the Society, Albany, N. Y. F. C. Curtis, M.D., Secretary.

Fifty special reports and papers on subjects of interest to all physicians. Report of the Committee on Hygiene emphasizes attention to the excessive mortality from preventable diseases during the Spanish-American war, and unsanitary camps. Shows encouraging progress in school sanitation; increasing interest of health authorities in infant feeding; legislative interest in and appropriation made for the purpose of investigation of cancer; legislative action for the establishment of a State hospital for the treatment of incipient tuberculosis, and urges more liberal appropriations by the Legislature for the work of the State Board of Health.

CONTEMPORARY LITERATURE.

THE MAN WITH THE HOE.*

Written after seeing Millet's World-Famous Painting.—By EDWIN MARKHAM.

"God made man in His own image,
In the image of God made He him."
—Genesis.

BOWED by the weight of centuries he leans
Upon his hoe and gazes on the ground.
The emptiness of ages in his face,
And on his back the burden of the world.
Who made him dead to rapture and despair,
A thing that grieves not and that never hopes,
Stolid and stunned, a brother to the ox?
Who loosened and let down this brutal jaw?
Whose was the hand that slanted back this brow?
Whose breath blew out the light within this brain?

Is this the Thing the Lord God made and gave
To have dominion over sea and land;
To trace the stars and search the heavens for power;
To feel the passion of Eternity?
Is this the Dream He dreamed who shaped the suns
And pillared the blue firmament with light?
Down all the stretch of Hell to its last gulf
There is no shape more terrible than this—
More tongued with censure of the world's blind greed—
More filled with signs and portents for the soul—
More fraught with menace to the universe.

What gulfs between him and the seraphim!
Slave of the wheel of labor, what to him
Are Plato and the swing of Pleiades?
What the long reaches of the peaks of song,
The rift of dawn, the reddening of the rose?
Thru this dread shape the suffering ages look;
Time's tragedy is in that aching stoop;
Thru this dread shape, humanity betrayed,
Plundered, profaned and disinherited,
Cries protest to the Judges of the World,
A protest that is also prophecy.

O masters, lords and rulers in all lands,
Is this the handiwork you give to God,
This monstrous thing distorted and soul-quenched?
How will you ever straighten up this shape;
Touch it again with immortality;
Give back the upward looking and the light;
Rebuild in it the music and the dream;
Make right the immemorial infamies,
Perfidious wrongs, immedicable woes?

O masters, lords and rulers in all lands,
How will the Future reckon with this Man?
How answer his brute question in that hour
When whirlwinds of rebellion shake the world?
How will it be with kingdoms and with kings—
With those who shaped him to the thing he is—
When this dumb Terror shall reply to God
After the silence of the centuries?

*"The Man with the Hoe and Other Poems."—Doubleday & McClure Co.

THE ORIGIN OF PHYSIOLOGICAL PSYCHOLOGY.

The movement had its precursory stages in the early part of the century, notably in the mathematical psychology of Herbart, but its first definitive output to attract general attention came from the master hand of Hermann Helmholtz in 1851. It consisted of the accurate measurement of the speed of transit of a nervous impulse along a nerve tract. To make such measurement had been regarded as impossible, it being supposed that the flight of the nervous impulse was practically instantaneous. But Helmholtz readily demonstrated the contrary, showing that the nerve cord is a relatively sluggish message bearer. According to his experiments, first performed upon the frog, the nervous "current" travels less than one hundred feet per second. Other experiments performed soon afterward by Helmholtz himself, and by various followers, chief among whom was Du Bois-Reymond, modified somewhat the exact figures at first obtained, but did not change the general bearings of the early results. Thus the nervous impulse was shown to be something far different, as regards speed of transit, at any rate, from the electric current to which it had been so often likened. An electric current would flash half-way round the globe while a nervous impulse could travel the length of the human body —from a man's foot to his brain.—Henry Smith Williams, in "Harper's Magazine."

AMERICAN UNIVERSITIES.

Edouard Rod, the distinguished French scholar who visited the United States last year to deliver a course of lectures, and incidentally to investigate the condition of the higher education in the United States, writes of "American Universities" in the September number of the "North American Review" in a spirit of high appreciation and admiration. M. Rod was specially impressed by the great vitality and enterprise shown not only in the multiplication of palatial buildings for the use of the universities, but in the establishment and endowment of courses of study which are unknown in the seats of learning of the Old World. While all the universities bore the unmistakable stamp of a common American character, each, he found, had an individuality of its own; and among the most taking portions of his article are those in which he delineates the special features of the various universities visited by him. M. Rod is enthusiastic in his commendation of American students.

THE SPIRIT AND THE FLESH.

Into this glorious world I came,
The free-born of the wind and flame.
I bound to me for good or ill
A body-serf to do my will.
Though he was frail and prone to rest,
I snatched him from his mother's breast
And bade him serve me. What would you?
I had a great king's work to do:
Wrong to make right; comfort to bring
To those in trouble sorrowing.

I needed one both swift and strong:
Great was the load, the journey long.
Yet this my slave was weak and lame;
Faltering at my behest he came:
So, when his strength was almost gone,
I took the scourge and urged him on.

Yet hurry as I might to keep
The minutes' pace, both food and sleep
My slave must have. Impatiently
I saw the glorious hours pass by
(I could not leave him, for we must
Have hands of dust to work with dust.)
At last he fell and would not rise.
He called me with imperious eyes,
And bade me pause.

This small white room, this cot of snow,
Ministering forms that come and go—
I crouch here listening for his breath,
And with my hands I hold back Death,
My work neglected and undone.
If he but beckon, swift I run
This worthless serf of mine to save.
How hard they toil who serve a slave!

—L. B. Bridgman in September "Century."

WORK OF THE CUBAN EDUCATIONAL ASSOCIATION.

The work done by the Cuban Educational Association has passed the experimental stage. The practical results obtained by bringing these young men from the Antilles and placing them in our American colleges, academies and schools have been far-reaching, and the influence for good specifically direct in turning the attention of the Cuban and the Porto Rican from militarism to the much-coveted pacific methods of our people and government. The importance of the work has already become national, and officers of the army and navy and civil attaches of the Government are co-operating to advance the work.

That these young boys in most of the cases in which the association has acted are bright, ambitious, malleable, winsome and worthy of the best work of the American educator has been easily demonstrated. The parents and guardians of these boys are more than grateful because the way has been opened for them to come to the United States and complete their education. Many of these people are willing to mortgage their futures that their boys may become beneficiaries in our educational institutions, knowing that such tuition will aid in the development of the boys and set them thinking how best to advance the interests of their own country.

We already have young men at schools in New Hampshire, Vermont, Connecticut, Rhode Island, New York, New Jersey, Pennsylvania, Maryland, Virginia, West Virginia, Alabama, Ohio and Michigan, and we expect before the new year arrives to have students in each State in the Union.—From "The Cuban Educational Association of the United States," by Gilbert K. Harroun, in the "American Monthly Review of Reviews" for September.

DEATH RATHER THAN A BATH.—The warden of the Hudson County Jail at Jersey City is authority for the statement that Giacomo Moreda, an Italian wife murderer, who committed suicide on August 8, killed himself to avoid taking a compulsory bath. The man had not washed his face or hands during the three months he spent in jail, and death appears to have been preferable to him to being placed in a tub and scrubbed till he was clean, a treatment that was ordered for him in order that he might be in a fit condition to put on a new suit of prison clothes which the warden had provided.

THE SANITARIAN.

NOVEMBER, 1899.

NUMBER 360.

OCEANIC HEALTH RESORTS.

By A. N. BELL, A. M., M. D.

WINTER HEALTH RESORTS for invalids and persons of tender constitution virtually resolve themselves into domiciles and places with healthful surroundings and appointments, under climatic conditions which comprehend the largest proportion of sunshiny days and atmospheric temperature which admits of unrestricted outdoor exposure.

The maximum of these conditions obtains at sea and, approximately, on some islands, insular and sea-coast places, where the soil is well drained and clean, and in such latitudes, or at such elevation, as to afford a congenial temperature. Such places the world over are exceptionally free from pulmonary diseases and noted for their general healthfulness. It has been too much the case hitherto, and particularly in this country, to disregard the advantages of islands and seacoast places, thus favorably conditioned, on account of atmospheric moisture. The erroneous estimate, in this regard, is based upon the consequences of exposure to dirty-soil moisture everywhere, and in particular to such of our seacoast places as are most exposed to the northeast winds of the Atlantic States that sweep down the fogs and mists of, and emanations from, a swampy seashore. Such places are particularly predisposing to pulmonary consumption and should be avoided by all invalids.

But sea-air proper is of a wholly different character. Though damp, as compared with the air of great altitudes, it is less damp than the air of sea-coast places, and is entirely devoid of the impurities common to such places. For example: The mean relative humidity of the air at noon observed by Wilson ("The Ocean as a Health Resort") during a voyage from Melbourne to London, via Cape of Good Hope, was 77 (100 per cent. representing com-

plete saturation), while in a dry locality in the neighborhood of London the mean for the year was 83. But this, Dr. Wilson remarks, represents the mean of three observations taken respectively at 9 a. m., 3 p. m. and 9 p. m. A fairer comparison would therefore be with the mean of the three o'clock observation, which for the year gave 71.5. Nevertheless, there can be no question, and it is conceded as a general truth, that the ocean atmosphere is considerably more moist than that of corresponding latitudes over the land. But, under the light of recent knowledge of the etiology of tuberculosis, clean moisture, atmospheric or otherwise, and particularly that of the ocean atmosphere, is no longer regarded as a cause, promotive of, or as an obstacle to recovery from, tuberculosis.

The supreme advantage of ocean-air is its exquisite cleanness. Its only extraneous substance is sea-salt. But, excepting in the trade winds or in gales, in such infinitesmally divided particles, that it is difficult to conceive of any possible state of the human system under which its inhalation would be detrimental—even in the trade winds and gales. But quite on the contrary, considering the purity of the watery vapor in the atmosphere and the perfect solubility of these particles, containing as they do, the important constituents of sea-water, the admixture, if it may be so regarded, is well adapted to produce very salutary results generally, and in most cases of pulmonary consumption decidedly beneficial effects.

Heat is much less oppressive on the ocean—indeed it is never so excessive as in corresponding latitudes on the land. The temperature is more equable for day and night. In the tropics (in the open sea) the average temperature is about 80°, the range from 72° to 84° F., and rarely as high as 86°.

Moreover, the higher electrical state of the ocean atmosphere, the more constant presence of ozone in it, and the more constant prevalence of the winds than on land in the same latitudes, are important attributes.

The winds, indeed, are a fertile source of health almost everywhere, because they serve to equalize the temperature and to scatter pernicious effluvia and condensed vapors; though in rare instances, even at sea, they may be unfavorable to health on account of the too close proximity to unhealthful regions over which they pass, or suspended matters which they contain. As an illustration of the distance which suspended matters may be

carried by the wind, the writer has seen the whole atmosphere tinged of a pinkish color by the dust-wafting winds over two hundred miles from the land, on the west coast of tropical Africa. (The dust in the air of the high altitudes in some regions of our Rocky Mountains and Pacific States, and in the arid plains of Texas and New Mexico, is a yet more familiar example.)

The influence of the ocean air-currents is most powerfully felt far out at sea in the trade-wind regions. Differing as these winds do in many respects from anything that is experienced on land, except on islands in their immediate trend, it is not surprising that they should, as they do, impress upon many persons an exhilarating effect peculiar to themselves. To many nervous invalids, particularly, the "champagne atmosphere of the trades," as it is not inappropriately called, is a tonic of the most powerful kind, scarcely attainable by any other means.

Of the constant healthfulness of the ocean atmosphere, even when surcharged with salt to the utmost extent, the inhabitants of Turk's Island and the Caicos afford a striking example. The islands comprise an area of 169 square miles situated at well-nigh the level of the sea between 21° and 22° north latitude and 71° and 72° 30′ west longitude, amid the trend of the northeast trades, which prevail incessantly throughout the year. The average temperature is 83°; the range 75° to 90°. By an analysis of the vital statistics for ten years, 1877 to 1886, by the writer, ten years ago, before the discovery of the tubercle bacillus and the danger of indiscriminate expectoration, the average population for the period was 4,732. About half of the population live in the village of Grand Turk, which mostly consists of frail structures devoid of sanitary conveniences, occupying a shore-line of about two miles in extent. The remainder are scattered. Much of the shore-line, including part of that of the village as well as otherwise, is waterlogged and swampy. "There are no sanitary requirements"; the whole people seem content to depend upon the forcible atmosphere and abundance of sunshine, for both health and the means of livelihood—on dissipation of emanations from a fouled soil, and water from the salt basins.

The total number of deaths from all causes among this people during the period referred to, was 1,055. From "pulmonary diseases," not discriminated in the registration, 155. "About one-fourth of these, or 3.8 per cent. of the total number of deaths, were consumptives." The largest number of alleged causes of

death (except of infants) was "senile decay," 165 with an average of about 74 years at death, and a range from 65 to 103.

Light, too, without question is an important collateral benefit of sea-air, and doubtless much of the rigidity of tissue and general hardiness which characterizes seamen is owing to this cause.

Free access of light favors nutrition and regularity of development, and contributes to beauty. To fully appreciate this relation it is only necessary to observe that thickly-shaded and dark places, and dwellings so situated as not to admit the sunlight are commonly unhealthful.

Sea-air proper is entirely devoid of deleterious qualities. The ill-effects sometimes ascribed to it are usually owing to the want of ship ventilation and due regard to cleanliness. Indeed, no truer maxim can be promulgated than that the want of cleanliness is the want of health everywhere, and ships are no exception.

But it should be constantly borne in mind that sea-air is not sea-coast air, nor is it, with but few exceptions, island or insular air. Nevertheless there are some approximations, insular and island.

FLORIDA is exceptional in another respect. Besides being insular and possessed of an approximately oceanic atmosphere, it has the benefit of an extensive pine forest.

The writer has taken occasion to observe elsewhere that—

"Those who would measure climate at the level of the sea by the meridian only will wholly fail to form a correct conclusion in regard to the climate of Florida.

"Northern Mexico, the Peninsula of California, the Desert of Sahara, Central Arabia, northern Hindustan, northern Burmah, southern China, and other regions of less note, and some of them insular, in the same latitude as Florida, have climates more or less similar to one another, but all strikingly dissimilar from that of Florida; and for the manifest reason that none of them are bounded by an immense body of warm water on one side and a swiftly flowing ocean current on the other, and the peninsula between covered by a luxuriant pine forest—a combination of conditions for the production, maintenance and modification of an ocean and forest atmosphere that exists nowhere else to the same degree, and which results in a climate peculiarly its own, remarkable for its salutary influence as a winter resort for invalids with pulmonary consumption."* So general are these conditions

* Climatology and Mineral Waters of the United States, Bell, p. 190.

throughout Florida that there is no need of specifying particular localities. They are all accessible by the Clyde Line Steamships and its connections, Wm. P. Clyde & Co., 5 Bowling Green, New York.

The mean December temperature of the State at seven localities from Jacksonville to Key West (latitude 30° 15′ to 24° 36′), is 61.32°.

NASSAU, the capital of the Bahamas, situated at an elevation of about seventy-five feet above sea-level, in latitude 25° 5′ N., has been long and favorably regarded as one of the most congenial and restful of winter resorts. The mean winter temperature is about 72°, the range from 64° to 82°.

There are many beautiful gardens, waving palms and abundance of tropical fruits, beautiful roads for wheeling and many other delightful temptations to enjoy the sunshine; and superb hotel accommodations.

Nassau is but 960 miles from New York, and is reached by the New York and Cuba Mail Steamship Company's Line, Jas. E. Ward & Co., 113 Wall St.

SANTIAGO DE CUBA, 560 miles distant and but forty-six hours' sail from Nassau, is reached by the same line by a beautiful sail through the Crooked Island passage round the eastern coast of Cuba, so close to land sometimes that one could almost toss the traditional biscuit ashore, and then looms up the entrance to the port of Santiago, an entrance so beautiful as to defy description.

Suddenly opens up the famous old yellow castle and a multitude of other objects which the recent war has made interesting to every American. Santiago is the oldest city of the West India Islands, founded by Velasquez in 1514, and still maintains much of its medieval construction. Hotel accommodations are rapidly multiplying, and of which there is no likelihood of any want for the winter.

HAVANA, too, is rapidly becoming much more attractive to American visitors than ever before, though it has long been the recognized metropolis of the West Indies, characterized by the life and bustle common to great cities elsewhere, and with abundant means of enjoyment: theatres, circuses, picture galleries, clubs, ball rooms, etc. But here invalids need not tarry; the country roundabout is attractive, there are good roads and pleasant drives. The air is approximately oceanic, the winter temperature equable

—from 65° to 70°—and from November to May the climate is exceptionally delightful.

From Havana, after a brief stop, the steamer proceeds across the Gulf of Mexico to Progreso, Tampico and Vera Cruz.

PORTO RICO is likely to become ere long one of the most popular of winter health resorts.

This island is situated geographically between parallels 17° 54′ and 18° 30′ 40″ north, and between meridians 65° 30′ and 67° 15′ west of Greenwich. Thus it is on about the same parallel of latitude as Vera Cruz, Hawaii, Dongola in Egypt, Bombay in India, and the northern end of the Island of Luzon in the Philippines.

Porto Rico is forty miles wide and one hundred and eighty miles long. A range of mountains extends through the island from east to west, having a general height of about 1,500 feet above sea level, with one peak (Luquillo) in the northeast, which attains an altitude of 3,678 feet.

The island is essentially an agricultural country, although in the mines of gold and silver, lead, copper, and other minerals, there is great wealth waiting the capital necessary for its development. It is especially remarkable for its flora and still retaining in the highlands much of its primeval forests.

Porto Rico luxuriates in orange, lemon, mango and coco trees, flowering trees, fern trees, and in groves of magnificent palms. It is fertile from mountain tops to sea-coast, with no great extent of stagnant water, but fed by thirteen hundred flowing streams, some in part navigable for small craft.

The towns most favorably situated as health resorts are Aibonito, situated 2,275 feet above sea level, an excellent coffee district; and Adjuntas, in the central cordillera, where the surrounding mountains are covered with fruit and coffee farms.

San Juan, the capital, is situated near the east end of the north coast, and distant from New York about 1,400 nautical miles. Here was made the first settlement on the island, in 1511. The picturesque Morro Castle commands the entrance to the harbor, the best in the island; and the old part of the city is still a fine specimen of a walled town, with moat, gates and battlements.

Ponce, on the south coast, is gaining rapidly in population and importance, though rated as second to San Juan. The general aspect of Ponce is the most picturesque on the island, and the town is also probably the most healthful. Ponce itself is situated

a short way inland; its port and spacious harbor are known as the suburb of Playa.

The climate of Porto Rico, on the whole, is excellent, rendered all the more salubrious by the unexceptionally excellent natural drainage. The average winter temperature is about 75 degrees, on the mountain slopes above 1,500 feet altitude 70 to 65 degrees. Porto Rico is regularly accessible from New York weekly by the Red "D" line of steamers, Boulton, Bliss and Dallett, 135 Front street.

JAMAICA, the largest of the British West India Islands, is situated in the Caribbean Sea, about ninety miles south of Cuba, within 17° 43′—18° 32′ N. lat. and 76° 11′—78°.21′ W. long., being about 144 miles in length by 49 miles extreme breadth. It virtually consists of one magnificent and picturesque mountain—the "Blue Mountains," so called—rising out of the sea. Ascending by a succession of hills, ridges and plateaus of continuously increasing altitudes, intersected by vales and streams with more or less abrupt precipices and overhanging cliffs, all covered with richest tropical groves and undergrowth, exhibiting the most magnificent scenery and culminating at an altitude of seventy-three hundred feet above sea level, yet never capped with snow. Though intra-tropical, one may almost choose a climate of any wanted degree of temperature from the ascending plateaus. From the nature of the conformation, however, there are some localities to be avoided. Between the mountain ridges there are some extensive waterlogged savannas, more or less productive or malarial fevers, which should be shunned. But after an altitude of two thousand feet and upward, beginning with a winter temperature range of 55° to 65° (there being a change of one degree higher or lower than at this altitude for about every three hundred and forty-five feet), there are many well drained slopes and plateaus of unsurpasssed beauty of scenery and healthfulness, with excellent accommodations for temporary visitors or prolonged residence.

For temporary winter rest "Constant Spring" Hotel, situated about six miles from Kingston, at an elevation of six hundred feet above sea level, on the northern edge of the savannah, known as the Liguanea Plains, which lies between the sea and the foot of the Blue Mountains, affords excellent accommodations. The views from the hotel are of charming variety and some of them of exquisite beauty. To the north and west lie the Blue Mountains, to the east the Lame Hills slope gradually to the sea, while to the south the plain stretches away to the harbor of Kingston, with the

Palisadoes terminating at the naval station of Port Royal. The average winter temperature at the hotel is about 75° and the weather delightful.

The mineral springs of Jamaica are of old and continued repute for the treatment of many chronic diseases. The chief of them are situated near the village of Bath, in the parish of St. Thomas, some twenty miles from Kingston by a good driving road, but reached more easily by the Atlas Company's coasting steamer, which lands passengers some eight or ten miles from it. It is a pretty West Indian village, the cottages being all of two stories, on one side of the main road which is bordered on each side by an avenue of Otaheite-apple, bread fruit and mountain cabbage trees.

The bath house is about one and one-half miles from the village and is reached by a pretty good driving road, which passes through a narrow gorge to a deep ravine in which the springs rise. These, some cold and some steaming, run across the road beyond the bath into the Sulphur River below. The house is in good order, having two large sitting rooms, plainly furnished, in the upper story, for the accommodation of visitors, and five bath-rooms on the ground floor, each containing a plunge bath, two of marble for ladies and three for gentlemen.

Into these baths the water from the hot springs is led by means of a stone gutter, the hottest water coming from the *kettle* at a temperature of 132° Fahr. The kettle is so called because it is covered in by stone work and has an iron lid at its apex, which when lifted gives exit to a considerable volume of steam.

The Jamaica Spa, consisting of two acidulo-ferro aluminous springs, is situated in the mountains at an altitude of about 3,000 feet, some four hours' drive from Kingston. These springs belong to the government and were, many years ago, of high repute; but the buildings have been neglected and the present accommodations are poor.

Jamaica is intersected throughout by splendid macadamized roads, besides several railways, and, considering the large number of accessible picturesque and healthful localities, with excellent hotel accommodations at reasonable rates, at various altitudes, it is, taken altogether, an exceptionally commodious and commendable winter resort.

It is reached from New York by the Atlas line of mail steamers. Pim, Forwood & Kellock, General Agents, 24 State street.

Moreover, proceeding from Jamaica by the same line, the in-

valid or tourist may enjoy a delightful twenty-five days' round trip cruise in tropical seas.

Leaving Kingston, the sail is across the Caribbean Sea to the Spanish Main, Nicaragua and Costa Rica, first stopping at

Savanilla, situated on the Atlantic side of the Republic of Colombia—formerly New Granada. The republic abounds in dense forests and is intersected by three ranges of the Andes, known as the Cordilleras. The temperature is cool and the climate healthful. The next stopping place is at

Carthagena, also in Colombia, only seventy-four miles from Savanilla. It possesses a beautiful harbor, the entrance to which is called Boca Chica. The city itself is surrounded by a wall built to fortify it, at an expense of millions of dollars, which at places is more than sixty feet thick. From Carthagena, after a sail of 450 miles, Port Limon is reached—2,000 miles from New York.

Port Limon is situated in the Republic of Costa Rica and is the most southern state of Central America. Port Limon is connected by railway with the capital city of San José, delightfully situated in a valley of marvelous luxuriance nearly 4,000 feet above the sea level.

A visit to San José is especially recommended. To those who intend making it, attention is called to Birriz Bridge, 600 feet long, which spans a canyon 200 feet above the water. Part of the journey can be made by horses or pack mules. This beautiful ride takes one from the climate of the tropic zone to that of the temperate, which for beauty of scenery cannot be surpassed. Birds of splendid plumage flit across one's path, orchids—for which Costa Rica is justly famous—hang from many of the trees.

From Limón the return trip begins, back to Jamaica and thence to New York, thus covering more than 4,000 miles by what has been universally pronounced to be one of the most delightful and health-giving short sea voyages taken by Europeans and Americans alike in any part of the world.

By another route, the steamer, instead of going to Carthagena, proceeds to Greytown, the Atlantic seaport of the Republic of Nicaragua. This place is of especial interest as the starting point of the Nicaragua Canal.

From Greytown the steamer proceeds to Port Limón, and, after a stay of two or three days, the homeward voyage is commenced, the route on this tour being directly to New York.

The cost for the entire trip is $125 and the steamers sail regularly throughout the season, now commenced.

Intending passengers will do well to secure berths as early beforehand as possible, and those who wish further information can apply at the company's offices, at 24 State street, where plans of all the steamers can be seen.

THE WINDWARD ISLANDS.

For a more prolonged ocean voyage, comprehending a number of delightful and healthful stop-over resting place, the voyage through the Windward Islands is commendable. It may be undertaken weekly throughout the winter from New York by the steamships of the Quebec Steamship Company, A. E. Outerbridge & Co., agents, 39 Broadway.

Several of the islands touched at by the ships of this line are so completely isolated as to afford the nearest possible approach to an ocean atmosphere independent of a ship at sea.

Within twenty-four hours from the time of departure from New York the tourist enjoys the balmy breeze of the Gulf Stream, and with a delightful four or five days more at sea, makes the first stop at Christiansted, Santa Cruz or St. Croix. This island is under Danish government, but the English language is chiefly spoken, and the voyager may well stop here for two weeks or longer to recuperate from seasickness, if he has suffered it, for the atmosphere is oceanic. There are comfortable hotels, as there are also at the only other town, Fredericstadt, a few miles distant. But little rain falls and there is no malaria. The island is twenty-five miles long by five wide; the roads are generally level, good vehicles available and the scenery pleasing.

The next stop is at St. Thomas, only thirty-five miles distant. This, too, is under Danish government, but the English language prevails. It consists of a mountain ridge extending the whole length of the island and attaining an elevation of 1,480 feet. The shore around is deeply indented and the shoal water studded with rocks. The temperature of the air here ranges a few degrees higher than that of the ocean. Charlotte Amalie, the only town, contains about 13,000 inhabitants. This place has some reputation as a winter stopping place for consumptives as also for kidney diseases. There are comfortable hotels at Charlotte Amalie, but there are better places further along. And here it may be remarked that one is scarcely out of sight of land during the voyage through this string of picturesque islands. But St. Kitts (the short for St. Christopher), the next stopping place, forty miles distant, would be out of sight but for the great altitude of its high-

est peak, 4,300 feet above the ocean. This is an English island of great beauty and fertility, comprising an area of 176 square miles, with a population of 31,000. Basseterre, the chief town, is rather unhealthfully situated, between a group of high mountains on one side and barren hills on the other. There are good hotel accommodations in Basseterre, a fine cathedral and several churches. There is some magnificent scenery and there are beautiful roundabout drives. But for the voyager to tarry here, he should rest upon the mountain slopes from two to three thousand feet above Basseterre, or, better, not at all.

ANTIGUA, sixty miles east of St. Kitts, also English, and the most important of this group of the British West Indies, it being the residence of the governor-in-chief, is a more healthful place. With its rounded hills and gentle slopes, beautiful harbor and extensive white beach, it is in pleasing contrast with the rugged, rocky surface of St. Kitts. Moreover, the hotel accommodations here, at St. John's, the chief town, are excellent; the society is good and enjoyable. The air is oceanic, and, altogether, it is a good place for a stop-over.

Leaving Antigua in the evening, daylight finds the steamer skirting the French island, Gaudeloupe, for about sixty miles. This island has only recently been made a port of call for tourist steamers, hence voyagers will find but few innovations of American life, and on this account the scenes in the market and on the streets are all the more interesting.

Continuing southward, the scenery of the islands, *en passant*, increases in grandeur and picturesqueness; the mountains attain greater altitudes, the cliffs to grander proportions and the vegetation increases in rank and richness.

DOMINICA and MARTINIQUE, the next stopping places, straddle the fifteenth degree of north latitude, lying one on either side. They are notable for the marvelous beauty of their scenery.

Touching at Dominica, the steamer lies off Roseau, the chief town, long enough to afford tourists an opportunity to take a pony excursion to Mountain Lake, or Grand Bay, both famous places on account of the scenery roundabout, and along the mountain paths by the way. Tourists are notified, however, that while the steamer remains here long enough to allow time for such a trip, in order to meet no disappointment on account of the possible short supply of ponies at the time of arrival, those intending to make the trip should notify the purser in advance, so that notice may be cabled to the agents ahead.

Those who are not well enough, or who are otherwise disinclined to take such a pony ride, need have no misgivings with regard to their enjoyment, however, while the steamer waits. The enchanting view from the steamer's deck is one which never tires. The blooming mountain, for such it verily is, in virtue of the rich verdure and gigantic trees which clothe it, rises nearly 3,000 feet above the sea. At an altitude of 400 feet the mountain sides are studded with tree ferns waving their great palm-like fronds over an almost impenetrable carpet of begonias, orchids, epiphytes, tillandsias and other plants, indigenous to the West Indies, and never seen in the utmost display of their beauty, as here, outside of the tropics. Two thousand feet higher up are seen great giant trees, festooned with air plants, their outspreading branches interlaced with climbing vines and bush-ropes binding them to the mountain sides. Above this is Mountain Lake out of view, near the top; an extinct volcano, and now a beautiful sheet of water. And in another direction Grand Bay, to be seen by the excursionists. Lest those left behind should suffer eye strain from the enchanting view, while waiting, there are public gardens within easy walking distance ashore, overlooking the town and the bay, where many beautiful and fragrant tropical plants may be viewed at close range. The round of this accomplished, should the excursionists have not yet returned, while the steamer still waits, sightseeing may be agreeably suspended by an enjoyable repast of fresh fish, game and luscious fruits at the "hotel" hard by, which will easily last until the steamer's whistle is heard—"all aboard."

MARTINIQUE is shortly reached. It fully equals Dominica in the beauty and greatly surpasses it in the grandeur of the scenery, and, as will presently appear, greatly excels it in interest to the invalid. As this island first strikes the beholder from a distance it appears to be naught but a great humpbacked mountain, towering up nearly 5,000 feet above the sea level, forty miles long, and covered from base to summit with such a vegetation as the tropics only display. It is about twelve miles broad, comprising an area of nearly 400 square miles, with about 165,000 inhabitants. St. Pierre, its chief city, at which the steamer stops, is situated in the sight of a broad bay, three miles long, with ever verdant and picturesque shore. St. Pierre is a substantially built town; storehouses with tile roofs; some of the streets and sidewalks are paved, but they are all narrow and generally crowded. Through the streets there constantly runs a gutter of clean water, sweeping away all surface impurities and with an evidently inspiring effect

on the habits of the people. For, if it so happens that the visitor arrives early in the morning, he will find these gutters—from the break of day to an hour later—alive with the people, particularly the younger portion of them, with their pet dogs, disporting themselves in this delightfully *clean* gutter water, fresh from the pure streams and lakes of the mountain-side. Moreover, cleanliness in dress and habitation is everywhere manifest among the people.

Beautifully laid out and clean squares ornamented with choice plants and flashing fountains, a charming public garden in the suburbs, containing a great variety of the wonderful tropical plants, with delightfully shaded walks and a museum; and here, on Sundays, a military band gives excellent music. There is a fine cathedral, a theatre and other places of amusement and good hotels, at from $3 to $4 per day.

The stores and shops are well supplied with French goods of all kinds and island curios in abundance. There are many delightful mountain drives, over good roads, and many places of interest to visit during the brief stay of the tourist or for a protracted stop-over. Among the many interesting carriage drives no accomplished jehu will fail to remind the tourist that a drive to the statue of Josephine, wife of Napoleon, who was born here and whose memory is cherished by all the natives, is one of the pleasantest.

The atmosphere is virtually oceanic, plus less humidity at 3,000 to 4,000 feet altitude, at the option of the visitor, with an agreeable temperature, amidst the most delightful scenery and other outdoor enjoyments.

There are warm mineral springs a few miles distant from St. Pierre of high local repute and much visited.

SANTA LUCIA, the next stopping place to Martinique, is alike famous for its picturesque appearance from the sea. Castries, the chief town and capital, lies at the head of a deep harbor, surrounded by strikingly beautiful mountain scenery, with hills and valleys noted for their fertility and salubrity.

BARBADOES, the most easterly of the Windward Islands, lies in latitude 13° 10′ N. and long. 59° 32′ W. The other islands of the Caribbean Group lie west of Barbadoes, and on this account are called Leeward Islands, Barbadoes being the division point. This island has been long remarkable for the extreme density and—excepting occasional epidemics of yellow fever years ago—healthfulness. The total area of the island is but 162 square miles, yet, according to the most recent census, it has a population of 182,-

306. Its remarkable healthfulness, under the circumstances, is doubtless due to the ocean atmosphere in its most intensified form —the trade wind.

The island is divided by a valley near the centre into two parts, northern and southern. Near the centre of the northern part Mt. Hillably rises to the height of 1,147 feet, but its direction is such as to afford no obstruction to the continuously prevailing trade wind from the eastward, sweeping any and all possible emanations from the soil or other source. Bridgetown, the capital, contains about 30,000 inhabitants. There are some very fine residences and pleasure grounds. There are several beautiful churches, fine and well-kept hotels with abundant accommodations for visitors—besides a particularly commodious one, with special reference to winter guests, at a beautiful seaside resort called Hastings—at $3 to $4 per day.

There are several celebrated springs, containing, besides iron, carbon dioxide and fixed alkali in different proportions, commendable to anaemics.

It seems almost unnecessary to state, after the reference that has already been made to the conditions of the locality of this island, that the climate is essentially oceanic. The recorded winter temperature ranges from 71° to 85°. It is a particularly commendable stop-over place; subsequently to resuming the voyage by a succeeding steamer of the same line to return—this being the terminus of the Quebec Steamship Company's line—or a change may be made hence to Jamaica direct by taking passage by one of the steamers of the Royal Mail Steamship Company, which here connects. They leave fortnightly. Fare, to Jamaica, $40, and from Jamaica to New York, by the Atlas Line, weekly, $50.

Here there is arrival and departure, weekly, of the steamers of the Quebec Company's Line, as at New York. The round trip ticket, taken at the outset, is $108; for some specially large deck rooms, $5 to $10 extra, good for six months. Tickets out to or return from Barbadoes, exclusively, $60.

On the return voyage the steamers touch at all of the most important places, particularly at those where tourists are likely to have stopped over on the outward voyage.

There are, besides, several "Condensed Itinerary" voyages by the ships of the Quebec Steamship Company's Line at special rates, for which would-be tourists should write to the company, and by the same line, steamers weekly to Bermuda. Fare, $30.

ATMOSPHERIC MOISTURE AND ARTIFICIAL HEATING.*

By W. M. WILSON, Milwaukee, Wis.

The importance of aqueous vapor as a constituent of our atmosphere was not exaggerated by Tyndall, when he startled the scientific world by the announcement that "The removal, for a single summer night, of the aqueous vapor from the atmosphere which covers England would be attended by the destruction of every plant which a freezing temperature could kill."

For a long time humidity, relative or absolute, has taken its proper place among the principal meteorological elements, and every meteorological service in the world maintains a series of observations of atmospheric moisture with the same care as that bestowed upon temperatures, barometric pressure, or rainfall. The intimate relation existing between the aqueous vapor of the atmosphere and its precipitation in the form of rain or snow has inspired practical meteorologists with the hope that in the study of this element might be found the solution of the problem of rainfall, and possibly lead to more accurate results in forecasting its occurrence. But while the relation existing between the various forms of water is very close, a knowledge of the exact conditions which exist, in sufficient force to account for a downpour of rain, has eluded our grasp, and the results of the study of this element, so far as practical weather forecasts are concerned, have been principally negative.

From a medical point of view, however, the importance of the relative evaporative power of the atmosphere, in estimating the peculiarities of special climates and their effects upon the human organism, must be evident to all who are familiar with the physiological functions of the skin and lungs, and of the mucous membranes of the entire respiratory tract. Indeed, according to Dr. Albert Buck:

"For certain classes of invalids the prevailing humidity at a given place is a matter of more consequence than the temperature; more important than the mean temperature—nay, in the opinion of some authorities, a matter of more import than is the variability of temperature, be the variations of the latter never so fre-

*Read at the Convention of Weather Bureau Officials, Omaha, Neb., October 13-14, 1898. From the proceedings.

quent, never so great, and never so sudden and sharp in their onset."

The connection which subsists between the humidity of the atmosphere and its capacity for absorbing moisture from bodies, both animate and inanimate, with which it is in contact, is a connection of the closest possible description, but it is a deplorable fact that medical literature is almost entirely lacking in a scientific explanation of the effect of the different degrees of humidity upon the animal economy. There is abundance of empirical evidence of the efficacy of the conditions prevailing in the different portions of the world for the cure of catarrhal and pulmonary troubles, but whether the improvement which not infrequently follows a residence in Colorado or New Mexico is to be accounted for by the dryness of the climate, as is the popular impression, the elevation above sea level, the abundant sunshine, the new surroundings, or the outdoor life, or whether it is the result of a combination of all, physicians are unable to say with any degree of certainty. It is, however, generally admitted that while aridity and elevation may play an important part in the curative process, the efficiency of the climate in this respect does not depend on these elements alone, as equally good results are obtained from a residence at Torquay or Falmouth, on the south of England, which are among the most humid climates on the globe, and are elevated only a few feet above the level of the sea. Many believe that the results, so far as humidity is involved, which follow a residence at any place possessing special climatic conditions, are not so much due to the dryness or saturation of the atmosphere as to the comparative freedom from sudden or extreme changes in humidity, incident either to the natural climate or to the comparatively small range between the humidity prevailing inside the dwellings and that of the outside air.

We will assume that during the winter months the normal relative humidity over the more populous portions of the United States, especially east of the Missouri and north of the Ohio rivers, is 72 per cent., and that the average diurnal range is from 60 per cent. to 85 per cent., which, it is believed, fairly represents the conditions prevailing over the area named.

For the purpose of obtaining data upon which to base a comparison between the average external humidity and the prevailing conditions with respect to moisture found in business offices and living rooms, observations were carried on during the past winter in buildings heated by steam, hot water, and hot air, and it was

found that the average relative humidity from steam and hot water heating, with an average air temperature of 72°, was 28 per cent., while from furnace heating it was as low as 24 per cent. Dr. Albert Barnes, of Boston, found that the relative humidity in his office building, with an air temperature of 72° was 31 per cent., while Mr. Henry, in investigating the relative humidity in the Weather Bureau building at Washington, during March, 1896, found that, with an air temperature of 72°, the relative humidity was 32 per cent. From these observations, it is safe to assume that the average relative humidity in dwellings and offices, during that portion of the year which requires artificial heating, is about 30 per cent., or about 42 per cent. less than the average outside humidity and drier than the driest climate known.

The evaporative power of the air at a relative humidity of 30 per cent. is very great, and when the tissues and delicate membranes of the respiratory tract are subjected to this drying process a corresponding increase of work is placed upon the mucous glands in order to keep the membranes in proper physiological condition, so that Nature, in her effort to compensate for the lack of moisture in the air, is obliged to increase the functional activity of the glands, and this increase of activity and the frequent unnatural stimulation, induced by the changing conditions of humidity from the moisture-laden air outside to the arid atmosphere within our dwellings, finally results in an enlargement of the gland tissues, on the same principle that constant exercise increases the size of any part of the animal organism. Not only do the glands become enlarged, but the membrane itself becomes thickened and harsh, and, sooner or later, the surface is prepared for the reception of the germs of disease which tend to develop under exposure to the constantly changing percentage of humidity.

If the limitations of this paper allowed, it might be interesting to notice some remarkable cases which have come under observation where catarrhal troubles have been relieved and apparently cured by simply introducing sufficient moisture into the air to bring the conditions to something near the normal.

The economic side of the question is equally interesting, and has the special attraction of being more nearly capable of a mathematical demonstration. In a room in which the temperature is 72°, with a relative humidity of 30 per cent., the temperature of the wet bulb is 54.5°. If a room with a sensible temperature of 54.5° is considered comfortable—and there is abundance of evi-

dence to show that the wet-bulb thermometer does not vary greatly from the sensible temperature under ordinary conditions—the same result can be attained by heating to only 60° and supplying sufficient moisture to raise the humidity to 70 per cent., which still conforms very closely to the normal condition of the outside air, so far as moisture is concerned. It would probably be impracticable to maintain uniformly a relative humidity of 70 per cent., especially with a low outside temperature, as the condensation upon the windows would be undesirable; but by heating to 65° the relative humidity could be held at 50 per cent. without any ill effects, except possibly on extremely cold days.

While no very accurate information is at hand as to the cost of heating at different temperatures, competent engineers estimate that about 25 per cent. of the cost of heating is expended in raising the temperature from 60° to 70°. If this be correct—and it is the best information obtainable at the present time—one-fourth of the cost of heating could be saved by holding the temperature at 60° and raising the humidity to 70 per cent.. still maintaining a wet-bulb temperature of 54.5°, the same as that obtained by heating to 72° under ordinary conditions. But to be conservative and avoid the possibility of any unpleasant results from condensation, our dwellings could be heated to 65° with a relative humidity of 50 per cent., and still save 12½ per cent. over the present cost. A practical test was made on a small scale during the past winter with a view to determining a comfortable sensible temperature and the possibility of maintaining the humidity at a constant percentage. A valve controlled by an electric current was attached to a steam radiator and the electric contact made through an ordinary hair hygrometer. By this means it was possible to steadily maintain the relative humidity at any point desired, but owing to lack of means of controlling the temperature, the experiment fell short of determining the exact temperature and humidity at which the most comfortable conditions prevailed. The recognition of the need of a larger quantity of moisture in dwellings heated by artificial means is not new, but the mechanical difficulties encountered in automatically introducing the moisture in sufficient quantities to accomplish the desired result, or of controlling the amount introduced, has largely deterred practical research in this direction. But it is hoped that these difficulties will be overcome, and at no distant day a humidifier will be as necessary an adjunct to every first-class heating plant as a temperature regulator is at the present time.

THE HAWAIIAN ISLANDS.*

By WALTER MAXWELL.
Director and Chief Chemist of Hawaiian Sugar Planters' Association.

AREA AND POPULATION.

The Hawaiian group comprises some eight distinct islands, seven of which have a registered population. These islands are separated from each other by ocean channels that vary in width from the narrowest, covering 6 miles of sea, to the broadest, measuring 61 miles. The archipelago lies within the limits of latitude 19° to 22° 15′ north and of longitude 154° 48′ to 160° 20′ west.

The superficial areas composing the group, with their respective populations, are as follows:

Hawaii, 2,000,000 acres, population 33,285; Maui, 400,000 acres, population 17,726; Oahu (seat of government), 360,000 acres, population 40,205; Kauai, 350,000 acres, population 15,228; Molokai, 200,000 acres, population 2,307; Lanai, 100,000 acres, population 105; Niihau, 70,000 acres, population 164; Kahoolawe, 30,000 acres. Totals: 3,510,000 acres, population 109,020.

The population record is the result of the census of 1896. Since that time, however, the total given has been appreciably added to, and the growth is in progress.

CLIMATIC CONDITIONS.

In relation to the small land areas, the variations in temperature and rainfall are extremely great. These variations are due, first, to land altitudes and, second, to the exposure to rain-bearing winds. Taking Honolulu as an example, the average of temperature for the year is 73° F., with an average of night temperatures of 68° F., and with 80° as the average of the year's day temperatures. The extremes of variation are 48° F. and 87° F. during the year's course. Locations at sea level, corresponding to Honolulu, with leeward exposures, present the same conditions, some having temperatures 1° to 3° higher, others 1° or 2° lower; while sea-level temperatures with a windward exposure are generally lower, in some cases 5° to 7°. Leaving the sea level, the air tem-

*From Yearbook, Department of Agriculture, 1898.

perature falls with increasing altitude; in certain ascertained locations it falls at the rate of 1° F. for each 200 feet. The rate of decrease of temperature, however, is very variable, being affected by such factors as prevailing winds, open or forest-covered areas, level or extremely broken up land surfaces, and the prevelence of deep valleys and alternating ridges. Due to these factors, climate is exetremely local, varying with the prevalence of conditions confined within very small areas. Yet, there is the general decrease in temperature with the increase in altitude, this rule progressing until a temperate climate is reached, the variation in temperature moving between above freezing point and 70° F. Finally the elevation depresses the mercury below freezing point, from which level the ascent leads up to the great mountain altitudes of from 8,000 to 14,000 feet, where many degrees of frost have been recorded, and where the snow lies during most, and in some places all, of the months of the year.

The variations in rainfall are as great as in temperature, the factor of altitude being the main cause of variation. At the sea level in Honolulu the rainfall is some 32 inches per annum; at an altitude of 900 feet the rainfall is 116 inches. On the island of Maui in one district the rainfall at sea level was 28 inches, and, during the same period, at an altitude of 2,800 feet the yearly rainfall was 179 inches. Exposure to rain-bearing winds, especially where the land surfaces are covered with forest, is also a controlling factor, in unison with the factor of elevation. In the driest district the rainfall rises with the altitude; but, taking the island of Hawaii as an example, between districts of the same island, and at corresponding altitudes, the actual records show variations in rainfall between 60 and 160 inches per annum. The extremes of variation in recorded rainfalls, covering the four chief islands, are between 12 inches and 19½ feet of rain per year.

These varying conditions of climate, due mainly to altitude, provide most reassuring possibilities in respect to the public health. It is also apparent that these great variations in temperature, by which even the limited area of these islands is resolved into actually tropical and temperate zones, constitute a basis upon which a most diverse agriculture can be built up.

SOILS OF THE ISLANDS.

Over the sites upon which the several islands rest to-day the waters of the Pacific rolled, and but a short time ago. The is-

lands are the result, on the one hand, of vast internal earth movements, whereby submarine levels were lifted up, and even raised sheer out of the water; on the other hand, continuous or successive periods of eruption, which were at first submarine, by vast outpourings of lava laid the broad foundations of the islands beneath the ocean surface, and finally raised the superb mountain cones and heights, reaching up to as much as 14,000 feet above the level of the sea. The whole islands, therefore, are of volcanic origin, and, geologically speaking, they are of very recent date.

In consequence of the volcanic origin of the islands, the soils are wholly derived from basaltic lavas. In respect of color and geological and chemical composition and nature they fall into the following classes:

(1) Dark-Red Soils.—Soils formed by the simple decomposition of normal lavas under climatic action, and more particularly where great heat and small rainfall have prevailed.

(2) Yellow and Light-Red Soils.—Soils which differ not only in color but also in their composition from the dark-red soils, these differences being due to special physical and chemical influences which marked their origin.

(3) Sedimentary Soils.—Soils derived from the decomposition of lavas at high altitudes, the decomposed matter being removed by rainfall and deposited over lower levels.

LOCATION AND CHARACTERISTICS OF THE SOILS.

On account of the gradual rise in altitude of the lands from the sea level to the mountain elevations already described, the soils have come to be spoken of also as "lowland" and "upland" soils. The measure of increase in altitude is, on an average, some 300 feet per mile, thus furnishing the acute slopes which have caused the formation of the sedimentary soils.

The "sedimentary soils" cover the levels and flats bordering on the sea, forming also the deltas receiving the wash from mountain gorges and valleys. These soils, almost without exception, are very fertile, and because of their great depth over considerable areas the fertility will be of long duration.

The "dark-red soils" are chiefly confined to the areas located immediately above the sedimentary flats and lowlands, on the leeward and dry sides of the islands. These soils are also of great depth and uniform composition, and their fertility, so far, is equal to that of the lower lands.

The higher lands, or such as range from 200 to 500 feet above sea level up to 2,000 feet, are extremely different in type and composition. Due to the heavy rains that fall upon the uplands, the decomposing lavas and soils have been largely borne down to the lower levels, and, as a result of the climatic conditions, those highlands soils are not only of small depth, but they also have been largely depleted of the more soluble elements upon which vegetation thrives. These soils therefore are less fertile, and their virgin fertility becomes comparatively quickly exhausted. In general, however, Hawaiian soils are of great virgin fertility. Agriculturally, they are young and in a state of primary freshness as compared with the soils of old continents and islands.

PRODUCTS OF THE ISLANDS.

The Hawaiian Islands are wholly dependent on agriculture for their industrial maintenance. There has been no industry not directly agricultural up to the present date of their history. This fact makes it very urgent that the agricultural resources, so far the only sourse of wealth of the islands, should be developed along all possible lines and to the utmost limit.

Sugar.—The production of sugar employs the major portion of the capital and labor upon the Hawaiian Islands; it also furnishes the bulk of the exports, and provides the wealth and maintenance of the great majority of the people.

It is about sixty years since sugar was first produced for sale upon the islands. At that time the methods of cultivation and manufacture were very crude and the production was small. Even so late as the year 1880 the total output is recorded as having been 30,000 tons. Without taking the time and care to traverse each stage in detail in order to show the "ups and downs" of the industry and by what efforts it has reached the present dimensions, it will be sufficient to state the total value of Hawaiian exports for 1897, and the proportion of that value accruing from the shipment of sugar: The total of Hawaiian exports for the year named amounted to $16,021,775.19, while the sales of sugar amounted to $15,390,422.13. These figures present at a glance both the sum of the trade which the islands transacted in 1897 with foreign countries (over 99 per cent. of which was with the United States) and the dominant and vital part that sugar plays in the industrial existence of the country.

Sugar is grown on Hawaii, Maui, Kauai and Oahu, the four

largest islands in the group, and its cultivation is about to commence on the islands of Molokai and Lanai. There are some sixty plantations now in operation, each one having its own mill or factory equipped for the manufacture of raw sugar. The sugar-growing and sugar-making capacities of these estates vary between less than 1,000 tons up to near 20,000 tons of sugar per annum.

Much of the low, level, sedimentary areas bordering on the seashore is used for growing sugar, while the areas of rich, dark-red soils, located at comparatively low altitudes, are used exclusively for this purpose. Very considerable breadths of the less fertile yellow and light-red oils, with larger stretches of uplands that reach up to 1,500 feet, and in locations as high as 2,000 feet above the sea, are also used, so far as it is found profitable, for sugar growing.

The relative fertility and values of the several soils are shown in the following statement from an official investigation, which embraces the average results of three successive crops:

Dark-red soils, 10,411 pounds of sugar per acre; sedimentary soils, 10,301 pounds of sugar per acre; yellow soils, 6,291 pounds of sugar per acre.

On an average two years are required to make a crop of sugar in Hawaii, while only one year is required in Louisiana, so that the sum of the Hawaiian yield requires to be cut in two in order to compare it more accurately with the annual production of Louisiana.

The area of arable lands used in growing sugar in Hawaii may be deduced from the figures in the following table, which also shows the annual production of sugar:

Annual Production of Sugar in Hawaii.

Year.	Cane manufactured.	Sugar made.	Yield of sugar per acre.
	Acres.	Tons (2,000 pounds).	Pounds.
1895.	47,399½	153,419½	6,472
1896.	55,729	227,093	8,148
1897.	53,825½	251,126	9,331

The average number of acres of cane manufactured for the three years given was 52,318. As the crop requires most of two years to mature, and as two crops are always in course of growth at the same time, it is seen that the acreage under cane is not less

than 105,000 acres. Since some small areas of extreme uplands are two and one-half years in reaching maturity, the above area must be considerably added to. Considering the further fact that some portion of the total area is always lying out for rest, we are justified in concluding that the land in use for cane growing is 125,000 acres.

Rice.—At the present time rice occupies the second place in the area of production and in the value of product. The total production can not be exactly estimated, since a part is consumed upon the islands. The exports of rice for 1897 were 5,499,499 pounds, valued at $225,575.52.

The home consumption is large and would greatly augment the production indicated by the exports.

The lands used for rice are chiefly the lowest flats found at the outlets of valleys and close on the sea. These lands are generally fertile, but often too low and swampy for cane culture. These locations are favored with an abundance of sweet water, which is discharging to the sea, and this is a first essential condition in rice culture. During the growth of the crop and up to the time of maturity the lands bearing rice are held under water, which is kept gradually flowing and not allowed to stagnate and sour on the ground.

The rice growers are almost wholly Chinamen. This race is able to work and thrive in conditions of location and climate which other peoples do not appear able to endure. From lowland climatic action, which is liable to induce low fever, especially among Japanese, the Chinaman is apparently immune. Certain small areas of low bog lands in and about the suburbs of Honolulu are being rapidly drained, cultivated and planted with vegetables or fruits or overflowed with sweet running water to support the rice crop.

The area of rice lands is not appreciably increasing. There is a tendency to use certain of these lands, which allow of it, for sugar growing, the present prices of sugar being very tempting.

Coffee.—The coffee berry is a natural product of Hawaii. It is growing wild in locations upon several of the islands. These wild trees have reached a large growth, and they are still furnishing berries to the native Hawaiians. When the berry was first introduced into the country is not known. It passes as one of the growths native to the islands and their conditions.

The interest taken in coffee to-day, however, with its prospec-

tive value, is lifting the question of production from a wayside matter into one of the most engaging industries of the islands.

Coffee is being cultivated upon the four larger islands. On Maui and Kauai the work has not passed the experimenting stage in areas and results. On Oahu the production is, in one district, getting on to a commercial basis. It is to the island of Hawaii, however, that one must go in order to see what is being done and to estimate the possibilities of the industry.

There are four main coffee districts on the island of Hawaii, namely, Puna, Olaa, Kona and Hamakua. A census of the areas in the several districts that are at this time under coffee has been attempted, but the data do not justify a precise statement regarding the number of acres and accomplished results. Many planters express areas by numbers of trees, but as the distances between trees are not uniform acreage cannot be reliably deduced. In the district of Olaa, which claims the largest total area and the greatest number of planters, the land actually under coffee is about 6,000 acres. The other districts have relatively smaller areas under plant than Olaa, but this present circumstances does not necessarily indicate the future relative importance of the several districts. The matter of soil, with the essentially associated climatic conditions, are the prime factors which will ultimately determine the values of the respective districts for permanent coffee growing.

An idea is had of the commercial importance of the coffee industry by observing the exports of the berry to other countries. Foreign shipments, however, do not expres anything like the volume of the total production, since the coffees used on the islands are chiefly home grown. The exports for 1897 were 337,158 pounds, valued at $99,696.62[1]. These figures, however, not only do not represent the volume of production for the year stated, but they fall still further short of indicating the present basis of the industry. The coffee tree requires several years of growth in coming to economic bearing. This means that while the present area of actually bearing lands is so much, a larger or smaller area may be in course of coming up and will be added to the actually producing lands within a year or so. This fact is well illustrated by the following conditions now obtaining in the Olaa district: Coffee area—under one year old, 1,821½ acres; one to three years old, 2,749½ acres; over three years old, 1,344 acres.

[1] Report of Hawaiian Collector-General of Customs, U. S. Treasury, 1897.

Certain of the areas of "from one to three years old" in 1897 are now bearing, and other areas are closely approaching that state.[1]

The coffee industry of Hawaii is not destined to impress the world by the great areas under cultivation or the volume of shipments corresponding to the production of other countries. Hawaiian coffees, however, are on the way toward a permanent reputation for high and specific quality. They have their own aroma and marked flavor as distinctly as does the Hawaiian pineapple, which makes it aromatically superior to most known pineapples. With the delicate flavor is also associated a mildness and freedom from the acridness that marks many individual and unmixed coffees that are on the market. Hawaiian coffee is complete in itself, and no known mixture adds to its native excellence. Prices already obtained for selected samples sold abroad justify the view that this coffee is capable of reaching a unique position, where quality and not price is the first consideration of the consumer. This consideration of "quality" makes it necessary in the highest degree that the culture shall receive specially intelligent care. It is further and equally necessary that the utmost attention shall be given first to the cleaning and then to the grading of the berries, in order to place them on the market in presentable and advantageous form.

The coffee industry is in the hands of men of varied nationalities. Among these are found Germans, Portuguese, Americans, Englishmen and Asiatics. The great body of coffee growers, however, are Anglo-Saxons. These men are, in the main, prospective and permanent settlers. If they succeed in their undertakings the country will be benefited by the addition of an industry which will bring with it a class of weighty and valuable citizens.

It is not possible at this time to speak with full detail and assurance upon the present economic condition of the industry. There are concerns which are reported to be already upon a paying basis and where good interest is being received upon the capital invested. There are others which have not yet reached the stage of returns on the outlay, and there are cases where loss and failure have resulted. These cases of actual failure, however, should not be allowed to prejudice the situation of the industry. The causes of failure in certain cases have been just those causes which would have induced failure in any undertaking. For example, where a man has gone into coffee with too little capital he has not been able

[1] For areas and conditions more in detail, see report of Consul-General Haywood to the State Department.

to hold out until the crop reached the bearing stage, or stage of returns. Again, men have gone into coffee culture without knowledge of, and experience in, the work, and loss and failure have followed in those cases also. It is most liable to be the case, however, that the man of small capital is also a man of little experience, since where there is more capital at stake and more experience to direct its expenditure men move slowly. Where both want of capital and of experience come together then the result is sure and not far off. Apart from individual cases, it must be said that natural conditions, such as soil and climate, the state of the younger plantations that are on the way to the bearing stage, with certain actual results from older plantations—all these justify the belief that coffee growing can become a sound and paying industry in these islands. Any tendency in growers to give up coffee for sugar, where it is possible, at this time is very doubtful policy; not because the sugar industry may become less profitable but rather that the lands that are now in, and going into, coffee are not suitable for continuous sugar planting, of which there is abundant proof.

The scale upon which it will be most profitable to carry on coffee planting has not yet been determined. The small planter may be able to make it work with coffee as the money-yielding crop, but producing most of the articles of food for himself and family. By men of capital, who have looked into the question more precisely from the financial standpoint, it is definitely stated that, in order to make coffee a permanent industry and capable of taking its place with other industries, the plantations must be on a comparatively large scale, so that it will be possible to engage a steady supply of labor for them and provide the best mechanical means for the cleaning and grading of the berries. One other view is that coffee will become the most remunerative as an adjunct to existing sugar plantations, chiefly on account of the matter of labor. It is strongly represented that as the altitude for coffee planting commences where sugar planting ceases, the industries are naturally contiguous, and by an adjustment of the labor staff could be made interdependent. There are two examples which indicate that this latter view may develop into a reality.

Fruits.—The fruits that are grown in quantities to amount to items of export are bananas and pineapples. The total production of these fruits it is not possible to give. The home consump-

tion of each fruit is very considerable, being consumed by all classes of the community. The exportations of the two fruits, respectively, for the year 1897, most of which went to the United States, with a fractional portion to Canada, were as follows: Bananas, 75,835 bunches, valued at $75,412.50; pineapples, 149,515 pecks, valued at $14,423.17.

These are the two chief fruits of the islands, for which there is an ample market in the United States free from competition with the American articles. Any other fruits, such as oranges, limes, and lemons, or stone fruits, although capable of being grown in abundant quantities to meet the island requirements, cannot be grown for export to enter into competition with the fruits of California.

The bananas grown on the islands are well known for their extremely good quality. Chinamen are the chief cultivators of the banana, which flourishes in rich, deep, alluvial or deposit soils on the low levels near the sea and in the rich and protected valleys. White men with their better methods surpass Chinamen in the cultivation of this fruit.

The pineapple culture has been taken up by Americans and other white culturists. The very finest fruit, however, is the small native pineapple, which has an extremely delicate aromatic flavor. The latter has been grown an indefinitely long time and chiefly by the native Hawaiians.

The capabilities of the Hawaiian soils and climates for variety and excellence of fruit production have not yet been amply tested. There are individual locations and private grounds where experiments are seen in course of trial which indicate that fine quality and an enormously increased quantity of the fruits mentioned and numerous others can be grown with full success.

Vegetables.—The city of Honolulu is almost wholly supplied as to its table needs by Chinamen, who occupy suitable lands within and around the city limits. The mode of distribution or service of houses is fairly good, but the quality and variety are limited and poor. Without specifying in detail, there is an ample field for improvement in the methods of supplying the tables of the city with green food of well-developed quality and freshness. The country districts provide themselves, yet hardly any surplus reaches Honolulu excepting native taro and a few bags of Irish potatoes.

New Cultures and Industries.

Concerning the addition of new cultures and industries to the ones that have been described very considerable may be indicated. Most prominent among probable successes is grape culture. There are numerous examples upon a small scale in several of the islands which attest beyond question that much can be done in grape and wine production. It is not possible to say at this time what action the soils may have upon the character of the juice and its products, excepting that much of these lands naturally tends to produce high purity and quality in the saps and juices of vegetable organisms generally, as compared with the soil and atmospheric conditions of other lands.

Also, in addition to fruits and their products that may be added to the present industries of the islands, it is quite within the limits of probability to say that the soils and climates of the islands will be found favorable for the culture of plants and trees that yield "barks" and "milks" from which medicinal preparations are made. The cinchona barks can certainly be produced on the sheltered altitudes of the islands. Again, there are the conditions here for producing growths yielding flavors and dyes.

Further, there is room for a great expansion in fruits and growths that thrive specially well in salt soils near the sea. The cocoanut trees thrive admirably in these locations, and in time would be remunerative as an incidental culture.

Some note is to be made of possibilities in cereal production. The great difference in climatic conditions, that is, in temperature and rainfall, of which account has been given, indicate that there probably exist locations at temperate altitudes where wheat, barley, oats and corn (maize) can be, and in fact are, successfully grown. At an earlier time wheat was grown in small amounts for bread making. Patches of oats may be seen to-day, while very recent experiences with American corn have shown that this cereal grows and matures perfectly. These observations are of special moment, since the successful establishing of small holdings and permanent settlers upon the available lands not under sugar will largely depend upon the ability of those small farmers to provide all the feed required by their animals, as well as most of the sustenance for themselves and their families. It is thus fortunate that the conditions suitable for growing coffee are also the conditions in which corn, sorghum, rye and other cereals and all common vegetables can be produced.

Forests.

The forest areas of the Hawaiian Islands were very considerable, covering the upland plateaus and mountain slopes at altitudes above the lands now devoted to sugar growing and other cultures. Those areas, however, have suffered great reduction, and much of the most valuable forest cover has been devastated and laid bare. The causes given, and to-day seen, of the great destruction that has occurred are the direct removal of forest without any replacement by replanting. Again, in consequence of the wholesale crushing and killing off of forest trees by cattle, which have been allowed to traverse the woods and to trample out the brush and undergrowth which protected the roots and trunks of trees, vast breadths of superb forests have dried up, and are now dead and bare. All authorities of the past and of the present agree in ascribing to mountain cattle, which were not confined to ranching areas but allowed to run wild in the woods, the chief part in the decimation of the forest-covered lands.

Forest areas reserved with respect to location and maintained in a state of vigor and sound growth are of the first importance to the agriculture of the islands. The greater number of the sugar plantations and all of the rice and banana fields are depending upon an elaborate and costly system of irrigation for their water supply, and the operation and availability of the irrigating waters are largely depending upon the area and state of the forests upon the mountain altitudes. It is not only claimed that cool forest covers cause precipitation of rain, but that the thick undergrowth and brush assist in conserving the water and in preventing its precipitous discharge to the sea, which conditions are indispensable in maintaining a regulated supply of water for distribution over lower lands.

Efforts have been made to restore the forest where it has been killed out. Several of these individual efforts have not only resulted in great benefit to the localities where the experiments have been made, but they are serving as object lessons, showing the immediate need of inclosing given forest areas and defending them against the action of cattle, thus allowing the depleted undergrowth and trees to come up again, a result which has followed in every case where inclosure has been adopted. Local efforts, however, do not meet the demands of the forest question from the standpoint of the interests of the islands as a whole.

What appear to be the most immediate needs are a thorough expert examination of the islands and of their requirements in permanent forest areas, an inspection of the existing forests, and the adoption of means for improvement and maintenance. It may be possible for such an expert survey to show that portions of lands still under forest could be cleared for cropping without prejudice to the immediate or to distant localities, and, on the other hand, to indicate that the disturbance of existing forest areas in given locations would result in detriment to agriculture all around. Because of its bearing upon the immediate and permanent interests of agriculture, there is no question which demands at once a more careful and expert investigation than the state of these island forests.

Insect Pests and Plant Diseases.

In reference to insect pests and plant diseases, a statement from Prof. A. Koebele, official entomologist of the Hawaiian Islands. bearing upon the existence of or liability to plant diseases, is here given, as follows:

"Dr. WALTER MAXWELL,

United States Special Agent, Hawaiian Islands.

"DEAR SIR: In reply to your inquiries, I will say that it appears to me that little fear need be entertained in regard to the introduction of scale and other insects, since we have here an abundance of parasites and predatory insects preying upon and keeping the same in check.

"Strict attention, however, should be paid toward guarding against the introduction of Melolontid, Elateria beetles, etc., destructive to living roots of plants, as well as to any fungoid diseases destructive to vegetation that are liable to reach the islands with soil or plants imported.

"Respectfully, A. KOEBELE.

"January 5, 1899."

The labors and experience of Professor Koebele upon the islands amply qualify him to speak upon the matter in question. and his statement gives the assurance desired within the limits spoken of.

Ranches.

Up to the present time the Hawaiian Islands have been supplied by home-grown meats, and the supply has been ample. In fact, it is recorded that the number of cattle ranging the grazing areas some years ago was so large in proportion to the consumption of meat, that they were slaughtered chiefly for the hides, the carcasses having but very small value. Since that period the meat-eating population has increased, while the areas devoted to grazing and the number of cattle have gradually diminished, so that at the present time we are face to face with a situation in which the supply will no longer cover the demand. The supply of the country districts is furnished by the immediate localities. In some cases the sugar plantations have cattle lands which meet the demands of the plantation labor and of local private requirements. There are also large independent ranches. After the local demands have been satisfied the surplus of meat cattle produced upon the several islands is gathered up and shipped to Honolulu, to meet the consumption of the city tables. It is thus seen that the first indications of short supply will be felt in Honolulu, and the meat supply associations state that this is already the case.

It has been found by investigation that districts upon the islands, notably Kauai, which formerly had a large surplus for shipment, are at this time barely meeting the increased and increasing local demands. Ranchmen report that "in given districts the supply is now hardly adequate to the immediate local calls." In view of these facts, it is at once apparent that the future meat supply of the islands, and particularly of Honolulu, will depend upon new factors and conditions. The present requirements of the city and of vessels making port at Honolulu are shown by the animals slaughtered in 1898, as follows: Cattle, 8,780; calves, 1,578; sheep, 9,171; swine, 7,266. These data were furnished by William T. Monsarrat, veterinary surgeon and Government Inspector of Meats. Mr. Monsarrat not only possesses all data relating to the number of cattle slaughtered, but he can also report upon the state of health of Hawaiian cattle. Concerning cattle slaughtered outside of Honolulu data are not available.

The course through which ranching may develop into a more remunerative industry and the means by which the home supply of meats may be rendered a sure factor and more nearly adequate

to the growing demands of the community are bound up with the future character of other industries, more notably that of sugar.

Formerly, and but little more than a quarter of a century ago, cattle were more numerous upon the islands. They had wider ranges to rove over and feed upon; they were the possessors of the land, and their value consisted chiefly in the labor and hides which they yielded. At that time the plantations, which were of smaller areas than now, were almost wholly worked by bullock labor. Even to-day there are still thousands of oxen used in plowing and hauling, their energies being utilized as mechanical force instead of in the form of meat. In the course of time, and that very recent, the sugar industry has undergone great expansion. The lands, some of which formerly were among the best for meat-making uses, have been absorbed by the plantations, and the cattle have been gradually forced within narrower limits at higher altitudes. With the increase in sugar the number of cattle has become relatively and constantly less. A first result of this change was that an adequate supply of "cattle labor" was not available. Room was thus made for mule and horse labor; more recently steam, as applied to the plow, has come in, and in some districts has almost wholly superseded animal labor in the field. With the extension of the use of steam for plowing and hauling, and the introduction of electricity where steam is less practicable, it appears a question of only a short time when the bullocks will be forever released from their yokes and the island cattle will be grown and used only for meat purposes. The present trend is wholly in the direction of a higher condition of things and the rate of change is distinctly rapid. Any change or reversion of the present relations of the sugar and cattle industries must depend chiefly upon the relative values of sugar and meat. At the present prices of sugar even the thinnest upland soils pay to plant with sugar cane. As an immediate fall in sugar values is not imminent, it is not apparent that any immediate change in the relations of the two industries will take place. However, this is not positive. When sugar declines from the present prices, which the cost of production makes probable in the near future (within the comparatively short time of three to five years, as regarded by most authorities) and the price of meat goes up, then the land areas, respectively under sugar and meat production, will undergo some change. A fall of from 1 to 1½ cents per pound in the price of sugar, and an increase of the same

amount in the price of meat will put back certain areas of the uplands to meat production. This change would very materially aid the increased production of meat, and would not seriously, if at all, curtail the output of sugar, since those poorer uplands are the least productive in sugar, although among the best quality for grazing at certain seasons of the year. Moreover, experience has shown that a greater and more permanent increase in sugar production is practicable by leaving out the worst of the uplands from sugar and concentrating labor, fertilization, and costly water upon the richer and more durable lowlands. With a reversion of a part of the uplands to grazing purposes the sugar production can still continue to expand to the limits that have been stated.

There are other conditions than the relative values of sugar and meat that control the remuneration from ranching, and which depend upon the ranch owners. In the first place is mentioned the quality of the cattle, which is dependent upon the management of the herds. Very considerable sums of money have been expended by well-known ranchmen and patrons of cattle breeding for high-class bulls. Pedigree animals of such breeds as Shorthorns, Devons and Scotch Angus (also some of the finer milk-yielding Jerseys and Alderneys) have been introduced and let loose upon the ranches. Considerable improvement has resulted from the use of these high-bred animals, yet the permanent results have not been anything like so great as they should have been, and for the following reasons: In the first place, the influence of the pure-bred bulls, when let loose in the herds, was spread over cows and heifers of all sorts and sizes instead of their service being confined to selected animals that would have rendered the most immediate benefits from crossing with good blood. Of course, it is not so practicable a matter to isolate and paddock cattle on a large ranch as it is upon a modern farm. Again, the stock coming from the high-bred crosses were not made the most of. The selection, omitted in the first coming together of the imported bulls and ranch heifers, continued to be neglected, no "culling" of the weaklings and undersizes being practiced, the breeding continuing from big and little, good-grade and scrub cows alike. These matters have been reported to the writer by several of the better-known ranch owners, and the results are apparent. With better values in prospect for home-grown meats, the management of the ranching properties will

be brought under the more modern systems in respect of the methodic introduction and changing of blood and a careful selection and culling of the breeding stock. At no previous time have the inducements to do good work on the ranches been so great, nor has the certainty of remuneration been so sure for investments in meat production on the islands. Ranchmen will be prudent if they take immediate advantage of the present situation; if they do not, and the supply of home-grown meat declines still further, the country will be obliged to enter upon the importation of frozen meats. This will only be profitable if done on a considerable scale; if large importations of meats are made it seems necessary for prices to fall, and home-meat producers will be the first sufferers. The meat supply is a matter of prime concern to the city of Honolulu. It is in the first degree desirable that fresh meats shall be available for daily use. Frozen meats that have been a long period on the ice, and subjected to changes of temperature during movements in transit, are not the same as meats killed on the ground and kept in cool chambers for a few hours, or at the most a day or two, before being consumed. It is found that meats and fowls that have been long on the ice spoil very rapidly in warm countries after removal from the ice. But the argument for the necessity of a home-meat supply in view of the contingencies of a war does not obtain, since if an enemy were able to cut off the islands from the mainland of the United States, it would be a much more simple matter to stop shipments between the islands, when Honolulu would be just as effectually starved out.

Dairying.

The requirements in milk and butter of the country districts of the islands are supplied locally. The milk demands of Honolulu are met by suburban dairies, which also furnish a part of the butter consumed, but the chief supply of butter is by importation.

The milk supply of Honolulu is also a matter of some concern. During the past year it has barely met the city's demands. This was, in part, due to the presence of United States troops, who were quartered near the city for some months. When considerable numbers of the soldiers were in the hospitals and in special need of milk, extreme difficulty was experienced in obtaining any-

thing like an adequate supply from the public dairies. In consequence several private families turned over their individual cows to the service of the United States military authorities.

The current price of milk (10 cents per quart) indicates the inadequacy of the supply; although it has to be considered that the cost of maintaining a dairy in or near Honolulu is greater in proportion to the number of cows kept than on farms in the United States. This is due partly to the price of imported feedstuffs and also to the prices of lands and the cost of applying irrigation water within the city limits.

The interests and protection of milk and meat consumers have been undertaken by the board of health, this organization having instituted examinations of meats and of dairy animals in respect of the existence or prevalence of liver fluke, tuberculosis and other diseases. Recent examinations, covering the year 1898, have furnished the following data upon the condition of herds and dairies:

Condition of Meat Cattle Slaughtered.

Animals.	Number slaughtered.	Number with liver fluke.	Number with liver abscess.	Number condemned from tuberculosis.	Total condemned.
Cattle	8,780	2,589	21	15	17
Calves	1,578	433	..	..	..
Sheep	9,171	50	..	..	..
Swine	7,266	..	..	..	..

Inspections of milch animals are given as follows: Number of cows inspected, 286; number of cows affected with tuberculosis, a majority; number of cows condemned, 10.

Mr. Monsarrat states that several of the worst affected cows were the individual animals of private families. These data, although not worse than are furnished by other countries, show the need of vigorous care.

The increase in the population of the city, with a permanent establishment of United States military headquarters, will increase the call for fresh meats and fresh milk and butter. Therefore dairymen, as well as ranchmen, will be amply remunerated for a more systematic and careful selection of animals from the standpoint of the public health, for a more rational management upon the ranches, and in the providing of food for the dairies.

The people of Honolulu are prepared to pay a just price for these cardinal articles of diet, but they may demand that the wholesomeness of the supply shall be guaranteed by the health authorities.

Labor Conditions.

The hired labor of the islands is used chiefly upon the sugar plantations, other industrial labor requirements being small in comparison.

In line with the expansion of sugar production, the demands for labor have increased. Originally the labor was done almost wholly by Hawaiians, but as the requirements increased, coupled with the somewhat native objection of many Hawaiians to hire at regular labor, the leaders of the sugar industry were obliged to look elsewhere, and this led to the introduction of Asiatic and other labor. In the following table is presented a view of the component nationalities of the population, and the relative numbers of each nationality engaged in plantation labor:

Population and Plantation Labor.

1897.	Hawaiians.	Chinese.	Japanese.	Portuguese.	Other foreigners.	Total.
Population ...	39,504	21,616	24,407	15,191	8,302	109,020
Labor	1,497	8,144	12,068	2,218	756	24,658

These figures amply illustrate the labor relations of the respective nationalities to the main agricultural industry of the islands. The Hawaiians, relative to their number, do not seek plantation work, and when they do, it is chiefly as teamsters, in which work they are good and desirable. The inclination of the Hawaiian is to personal occupation rather than to labor for others. This is, in part, due to an objection to continuous labor, but more to the native instinct, which is averse to subjection, unless to Hawaiians of high standing or white people of authority. The writer hopes to see this characteristic of the Hawaiians maintained, and that the pride of the native people will assume such a course as to accommodate them to the new conditions in such a way that the race will yet re-establish for itself a permanent economic position in the community.

A reference to the figures of the above table also shows that

the Portuguese do not generally go to plantation labor. These people are very energetic and thrifty. They are inventive along the line of introducing new, small horticultural growths, such as the grape, etc. When they do work on plantations it is usually as teamsters, and they are comparatively highly paid for unskilled labor.

The burden of agricultural labor is borne by the Asiatics. One-third of the Chinese and one-half of the Japanese populations are engaged in plantation labor. The large remainder of the Chinese is privately occupied in rice, or fruit and vegetable culture, or in domestic service.

Concerning the conditions of the Asiatic laborers, it may be said, in general, that the presence of these peoples here demonstrates that the wages and personal comforts are greater in their present situation than they were in their native countries. This is further accentuated, in the case of the Japanese especially, by their disposition to settle permanently on the islands.

In regard to the question of compensation, a bare statement of wages does not cover the situation nor furnish a full comparison of the conditions that obtain here with the compensation of labor in other countries. The cost to the laborer of providing himself with fuel, clothing, and food is less upon these islands than, for example, in Louisiana, or in any other section of the United States. On the other hand, the value of labor to the employer, where the labor is paid at so much per man per day, depends upon the laborer and his power to work. From this standpoint it is found that different nationalities are capable of rendering different amounts of labor per day, and they are thus paid different wages. The power to work and the rate of wages of the Asiatics are less than in the case of white men (and of colored peoples in cooler climates) where the conditions of climate allow the latter to work. Where the climatic conditions exclude the white man the labor power of other races is also low.

General statements, however, upon this and all similar subjects are not of much value, so that a summary is here given of the labor roll for the month of December, 1898, from the largest sugar-making estate on these islands, the Ewa Plantation Company. All skilled labor, composed of Americans, British, Germans and Norwegians, is excluded, only Portuguese and Asiatics being included:

Laborers and Wages.

Laborers.	Number of laborers.	Wage per month.	Monthly total.
Portuguese	34	$27.55	$930.70
Contract Chinamen.....	204	15.16	3,092.64
Day Chinamen.....	67	16.73	1,120.91
Contract Japanese.....	380	15.66	5,950.66
Day Japanese.....	100	18.04	1,804.00
Total	785	....	12,899.05

The differences between "day" and "contract" men are chiefly due to the fact that the day men are ex-contract and experienced laborers. It is thus seen that 785 laborers receive $12,899.05 in money, which is $16.43 per man per month, or 63 cents per day. Where overtime is made by the laborers, either contract or day men, the time is duly paid for. If all the plantations were canvassed the mean monthly wage would be found to be slightly higher than that in the example given, since on the larger plantations the number of higher-priced men is relatively smaller than on smaller plantations. This is still more especially the rule in respect to skilled labor.

The table gives only the payment in money per month. All the laborers, however, receive free lodging, free fuel, and free medical attendance, and their children free education.

More point will be given to the statement of wages paid to labor on these islands if a comparison is made with the values of labor in corresponding conditions in the United States. For this purpose Louisiana is selected. In 1896 data upon the prices of plantation labor in Louisiana were furnished to the writer by the Hon. John Dymond, planter, editor, and sugar statistician of New Orleans. Mr. Dymond states in reply to questions: "The average monthly wage for years has been and is $20, or 75 cents per day. This does not cover the grinding season (of some sixty days), when about $1 per day is paid." The grinding season in Hawaii lasts one hundred and fifty days or more, when special wages are earned by overtime. For the purpose of comparison the special wages are excluded in both cases, although that item is in favor of the Hawaiian laborer. Mr. Dymond further says, "The plantation laborers are furnished free house room; they

steal their fuel, and require but little medical attention; work stopped by weather stops also the wages." These conditions are partly similar, but less favorable than corresponding conditions on Hawaiian plantations, the difference being decidedly in favor of the Hawaiian laborer. Again, the Hawaiian laborer requires less clothing, and, what is more important, he does not need to lose one day in the year from the weather. These considerations cause the comparison to be drawn as follows:

Comparison of wages in Louisiana and Hawaii: Louisiana, wages per day, $0.75; per month, $20. Hawaii, wages per day, $0.70; per month, $18.20.

A detailed comparison, including the extra money earned by overtime, would make the wages paid in the two localities almost, if not exactly, equal.

So far, the case has been stated for the laborer, showing the value of his labor to him. The cost of labor to the employer in Hawaii may now be shown. In addition to the 63 cents per day paid in money, the employer furnishes fuel, which is very dear (coal, $10 per ton; wood relatively dear), and a free doctor in addition to what is allowed in Louisiana. These extras raise the cost to 66 cents per day per man, but these extras are trifling in comparison with the extra cost per laborer per day that arises from the difference in the ability of the several nationalities to work. In the example given, the Portuguese receive, on an average, $27.55 per month, and the Asiatics $15.93 per month, which indicates that the latter possess a power to work and consequently are paid 43 per cent. less than the Portuguese. Mr. Dymond states that where men in Louisiana are on piecework the variation in their earnings is 37½ per cent. These examples are very pronounced, and probably extreme. It appears quite safe, however, to put the labor power of the Asiatic at 18 per cent. less than that of the mixed labor of Louisiana, which is equivalent to saying that four Louisiana laborers are equal to five Asiatics. The difference is greater rather than less than is stated. Then, in view of these special considerations, at least 18 per cent. has to be added to the 66 cents per day that the Hawaiian employer has to pay for his laborers, and this raises the cost of labor per day to 81 cents, which is 6 cents per day more than the average rate of wages in Louisiana, as stated by Mr. Dymond.

There is extreme confusion existing in the matter of labor values in different countries, which is due to the fact that the

daily wage is taken as the sole evidence of cost. This applies to other kinds as well as to agricultural labor. A house carpenter in Boston receives from 25 cents to 75 cents per day more than a corresponding carpenter in Honolulu, but the Boston man, due to total suspension of business for about four months in the winter, earns very considerably less annually than the man in Honolulu, who practically has not to lay off a day in the year; and between what is called coolie labor, operating in warm climates, and mixed American labor, or selected Asiatic labor, working in cooler climates, there are differences in labor power which cause extreme variations in the values and cost per day of those kinds of labor.

COLLECTIVE REPORTS ON GLYCERINIZED VACCINE LYMPH.*

By ALBERT C. BARNES, M. D., Philadelphia.

The recent widespread epidemic of smallpox in the United States has necessitated general vaccination, which had afforded excellent opportunities to determine the exact actual and comparative value of glycerinized vaccine.

For the past ten months I have been collecting reports from various infected districts in an effort to ascertain not only the actual value of glycerinized vaccine as a protective against smallpox, but its relative value compared with vaccine points, quills, crusts, and the older methods of producing vaccination.

Other objects to be determined were (1) the value of glycerinized vaccine as a preventive of smallpox; (2) the proportion of successful "takes" in both primary and secondary vaccinations; (3) the relative frequency of complications, such as diffuse inflammation of the vaccinated area—cellulitis, lymphangeitis, lymphadenitis, ulcerations, abscesses, etc.—which so often follow the use of vaccine points.

The methods of inquiry adopted in this investigation, were by circular-letter and personal inquiry, by large numbers of physicians throughout the country.

In a certain number of cases where wholesale vaccination was practiced, as for instance by health authorities, exact figures

*From American Gynecological and Obstetrical Journal, September, 1899.

could not, for various reasons, be obtained. However, in such instances, the reports were conservative and were none the less illustrative and convincing.

In Baltimore, where for several months there has been a number of cases of smallpox, there were employed by the health authorities and physicians in private practice considerable over 100,000 tubes of glycerinized vaccine. Those vaccinated were periodically observed until the success or failure of the vaccination was determined. In not a single instance did smallpox occur in a person vaccinated with glycerinized lymph. Conservative estimate places the number of successful takes as 95 per cent. in primary cases. The vesicles in most instances were typical and uncomplicated with staphylococcic and streptococcic infection. The number of excessively sore arms did not exceed one per cent. of the total number vaccinated.

In Minneapolis, in one series of 3,045 vaccinations with glycerinized lymph there were 29 failures, all of which were in secondary cases, *i. e.*, those who had been previously vaccinated. In the same city a second series of 3,875 vaccinations resulted in four failures in primary cases and in 51 failures in secondary cases. All the data collected from Minneapolis show a proportion of 95 per cent. successful "takes" in primary cases and 75 per cent. in secondary cases.

Cleveland records show that widespread vaccination was practiced. Both glycerinized vaccine and points were employed at the beginning until results proved the vast superiority of the glycerinized lymph when points were almost entirely abandoned.

In one series of 20,000 cases vaccinated with the glycerinized product, there was an average of over 90 per cent. successful takes. Septic complications were almost entirely absent.

In Richmond, Norfolk, and Portsmouth, Va., no accurate records were kept of results obtained, but in these three cities there were employed about 120,000 tubes of glycerinized lymph. Extensive inquiry concerning results obtained, places the successful takes over 90 per cent. In these cities the superiority of the glycerinized lymph over the points, in producing successful vaccinations and avoiding septic complications, were everywhere noted. The experience of the health authorities and physicians in private practice in Norfolk, is particularly valuable. At the beginning of the smallpox outbreak, vaccine points of a standard make, were employed extensively. In a large number of cases,

smallpox in a virulent form occurred among patients who had been vaccinated with points. This shows that the inflammatory reaction which took place at the site of vaccination, was due to staphylococcic infection and was not true vaccination.

From Philadelphia, Indianapolis, Chicago, Gloucester Co., Va.; Pittsburg, Allegheny, Standwood, Ia.; Lisbon, Ia., and over 40 small towns throughout the country responses to inquiry show that while no accurate records were kept the glycerinized vaccine, in comparison with points, had proved so superior in producing successful vaccinations (averages from 90 to 95 per cent.) and in affording freedom from septic complications, that points had been largely abandoned in those places in which comparative tests had been made.

In Porto Rico, under the supervision of Dr. George G. Groff, Major and Brigade-Surgeon U. S. A., extensive vaccination was practiced. Vaccine points in this climate failed entirely, while glycerinized vaccine yielded about 90 per cent. of successful vaccinations.

Dr. R. T. Hammond, Jessup, Md., had vaccinated 236 patients with glycerinized lymph and had but one failure; no excessively sore arms resulted.

A series of 70 vaccinations in private practice in Indianapolis, with glycerinized lymph, showed successful takes in all but one case. No septic complications.

Dr. F. V. Ely, Pittsburg, secured 36 successful takes in a series of 40 vaccinations with glycerinized lymph. This is remarkable, inasmuch as at least one-third of these cases were secondaries.

Dr. F. A. Crosby, Beach Ridge, N. Y., reports 100 per cent. successful vaccinations with glycerinized lymph in a series of 60 cases. Sore arms were not noted.

Dr. G. G. Rusk, Baltimore, vaccinated 360 persons with glycerinized lymph and obtained a successful "take" in every instance.

Dr. C. T. Mattefeldt, Catonville, Md., employed glycerinized vaccine in a series of 157 cases, 20 per cent. of which were secondaries; 155 successful vaccinations resulted.

Dr. D. W. Dodson, Nanticoke, Pa., reports that in a series of 250 cases he secured 100 per cent. successful vaccinations with glycerinized lymph.

Dr. J. R. Faust, Mann's Choice, Pa., vaccinated 130 school children and teachers, every one of which was successful.

Dr. A. J. Taylor, member of Board of Health, Caribou, Maine, reports 200 primary vaccinations with 30 failures; of the latter 27 were vaccinated with 14 successful takes. This experience shows the value of revaccination in those cases in which successful result did not follow first vaccination. The average in this series of cases was over 90 per cent. successful "takes."

Dr. W. F. Beyer, Punxsutawney, Pa., vaccinated 300 cases, *primary and secondary,* and secured 98 per cent. successful "takes"—in other words there were but six failures.

A large number of other private reports show that glycerinized lymph yielded from 90 to 100 per cent. of successful takes in primary cases and from 60 to 75 per cent. in secondaries.

Conclusions: This investigation proves conclusively that the recommendation of the United States Marine Hospital Service that "glycerinized vaccine only should be employed" ("Public Health Reports," January 9, 1899) is well substantiated by experience, because:

1. Properly prepared glycerinized vaccine is pue and free from staphylococci, streptococci, and other pathogenic organisms which are invariably found (Copeman, Crookshank, Pfeiffer, Reed, U. S. A.) on vaccine points.

2. Glycerinized vaccine affords absolute protection against smallpox; vaccine points are uncertain in this regard.

3. Vaccination with the glycerinized products does not cause excessive inflammation of the vaccinated area. Cellulitis and inflammation of the lymph vessels and glands amounting at times to abscess formation is a not infrequent sequence of the use of vaccine points.

4. Vaccine points are apt to lead to a false sense of security. inasmuch as they induce a local staphylococcic or streptococcic infection which is entirely distinct from true vaccination. Such a result is not protective against smallpox.

5. A high estimate of successful takes from vaccine points, is by these and numerous other reports shown to be not over 60 per cent. in primary cases and a much lower percentage in secondary cases.

6. Glycerinized vaccine has been officially adopted by the governments and health authorities of the United States, Great Britain, Germany, France, Russia and Belgium. It should be universally adopted in private practice.

SCHOOL SEATS.*

BY E. H. BRADFORD, M. D., AND J. S. STONE, M. D., BOSTON.

As it is often asserted that school chairs furnish one of the influential factors in the development of lateral curvature, a careful study of the proper form of school chair deserves and has received much attention. The results, however, are neither as satisfactory nor conclusive as is desirable, as the seats supplied in our schools are not always suitable.

The movement for reform in school furniture may be said to have begun with the publication in 1841 by Barnard, of Hartford, of his classic work on school architecture. Preceding this publication there had been, however, considerable discussion of the subject. About ten years earlier in Boston Dr. John C. Warren and Dr. Alcott, and in New York Mr. William J. Adams, had begun to advocate the use of sloping desks of proper heights, the separation

FAULTY ATTITUDE IN SITTING.

of the seats from the desks behind, and the use of individual seats with backs.

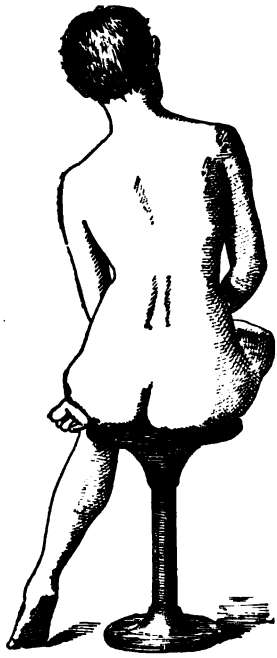
* Read by title at the annual meeting of the American Orthopedic Association, 1899.

The use of seat backs began about fifty or sixty years ago. Then followed the introduction of separate seats and later, at about 1850, the separate desks and chairs were first used. Attention had also been directed to the horizontal "distance" between the back of the desk and the front of the seat. Although a "minus" distance in which the desk overhangs the seat was advocated by some, yet Barnard and Alcott believed in a zero distance, which was, however, a step in advance as compared with the former "plus" distance of several inches.

Barnard was the first to make definite measurements of children of different ages and to devise from this a scale for the height of the seat and desk. In 1863 Fahrner, of Zurich, published the first European scale. There have since been published in this country the Whitcomb and the Bobrick scales, while in Europe the Frankfort scale, published in 1885, and the scales of the Prague and Vienna Commissions, published in 1892, are the most important. Much attention has been given to the various scales according to which fixed furniture is constructed and by which adjustable furniture is fitted. Being based on different series of measurements of children of different nationalities and classes there have been considerable differences in the results. Moreover, different standards are taken as the basis from which seat height and desk height of adjustable furniture are computed, as, for example, in one scale knee height and in another total height is taken as the basis.

ATTITUDE COMMONLY ASSUMED BY WEAK-BACKED CHILDREN.

While the scales have served a very useful purpose in bringing about more accurate fitting, according to averages, they cannot, of course, compare for accuracy in special cases with individual measurements made, for instance, in the school measuring chair, devised by Dr. Hartwell, in which at one sitting all the required measurements are easily read off. In the use of individual measurements, particularly in weak children, and in children above or below the average of those of the same age, and in careful attention to the seating of such individuals, much good may be done,



FAULTY ATTITUDE.

although at present the universal adoption of complete individual measurements can scarcely be expected.

At the same time that so much was being done in the development of various scales there were introduced many different kinds of adjustable furniture, both desks and chairs.

The problems of desk construction are, according to Cohn (1), to secure such a "difference" in height between the desk surface and seat that the elbow with the arm hanging naturally just reaches the desk, which brings the book at the proper distance from the eye; (2) to secure such a horizontal "distance" between

the seat and the desk that the body and head may not be inclined forward too far in order that the eyes may be near enough to the desk; (3) to have a proper slope to the desk surface. For purposes of reading the ideal slope is 45, because then the eyes can be directed downward without fatigue and without bending the head forward. Such a slope, however, is not practicable for writing, and therefore, as a compromise, a slope of from one in six to one in ten has usually been adopted.

Modern construction in all adjustable desks meets the requirements of proper height. The problem is simple because there is no need of automatic change. The need for automatic change by the scholar in the horizontal distance between the desk and seat has been met in two ways, first, by movable desk tops and second, by movable seats. Of the movable desk tops there were two types. In one the surface is divided transversely so that one part may move upon the other, usually the posterior part folding over on top of the anterior, as in the desk devised by Parow in 1865.

There are also a great variety of mechanisms by which one-half

FAULTY ATTITUDE FROM TOO LOW DESK AND STOOL.

of the desk top slides upon the other. Some are comparatively simple, some are rather complicated, most of them, as of the folding type, are not used because of the break in the writing surface. Some obviate this difficulty by making practically the whole of the desk surface movable, leaving only a small portion at the forward edge fixed, thus approximating the type in which the whole desk

top moves. So much weight has been attached to the importance of a movable desk top by Lorenz and Cohn, among others, that much attention has been paid to perfecting the mechanisms by which the desk top as a whole is moved.

Some of the folding and some of the sliding desks meet the third requirements of desk slope by making a change at the same time that they change the distance, so that for reading there is a positive distance with an increased and a decreased slope. The Simplex desk of Schenck deserves particular attention. In it the "distance," the "difference" and the slope are all altered automatically. by a very simple mechanism. By a simple mechanism also in the modern Chandler desk the slope and the distance may be changed together or independently as the scholar wishes. A certain amount of instruction and care is, however, necessary for the

FAULTY ATTITUDE FROM TOO LOW DESK AND STOOL.

intelligent use of a desk of this sort, which is not necessary for those of the simplest construction.

Of course in the difference in height and the horizontal distance between the seat and the desk the chair must also be considered. Thus many adjustable seats have been made at the same time that the desks were improved. It is now universally recognized, in re-

gard to the chair, that the height of the seat should equal the length of the leg from the sole of the foot to the under surface of the thigh when the feet are placed squarely upon the floor and the knee is bent to a right angle. It is generally agreed that the seat surface should slope slightly from front to back so as to counteract the tendency to slide forward, but not slope so much as materially to tilt the pelvis if the child sits sidewise in the seat. The length and breadth of the seat should correspond roughly to the dimensions of the thighs. A seat of insufficient depth can cause no particular harm. A seat of too great breadth allows, while one of too great depth compels, bad postures. The last requirement is, as stated by Hartwell, that "the seat should be provided with a back that shall support the sitter's back whether he be quiescent or actively engaged, as in writing or drawing."

FAULTY ATTITUDE AT SCHOOL.

Adjustment for height is a comparatively simple matter. In some cases it is secured by adjustment of the foot rest, but now all modern seats have simple adjustments in the castings.

In order to obtain an adjustment for distance from the desk several types of seat have been made. As examples, Beyer devised one in which the seat slid on its supports, Wackenroder one in which the seat slid forward and back together with its supports and Hippauf one in which the seat, by a parallelogram motion, could be moved forward and back upon its support like an in-

verted pendulum. In each of these the seat back was attached to the front of the desk just behind and therefore was available only with a "plus distance." The same was true of the seat of Wandenesch, which secured a plus and minus distance by eccentric rotation on its support.

Various folding seats, such as the "Columbus" of Ramminger, secured the change of distance merely as an aid in getting in and

ILL-FITTING DESK AND STOOL.

out of the seat. Many modern seats have fixed adjustments for distance, but in most cases where an automatic adjustment is sought for it is obtained through a movable desk top. One seat in particular, devised in Copenhagen, deserves attention because the height of the seat, the distance from the desk, the depth of the seat and the height of the back can all be changed automatically at the same time. The supports at the two sides of this seat are split from above and in front diagonally downward and backward so that as the seat is raised up by notches it also moves nearer to the desk. The back also is drawn nearer to the desk as the seat is raised. The construction is, however, rather awkward. In some of the Bobrick chairs a similar mechanical principle is applied to the back, although the adjustments are not automatic. There have been a considerable number of seats constructed for home use which are adjustable in all their parts so that they may be

used alike by small and large children, but these are all rather too awkward for school use.

The great problem of chair construction has been the back. Meyer in 1867 was among the first who carefully studied the question of seating and the mechanisms involved. In the sitting posture the weight is borne principally on the tuberosities of the ischium. When the centre of gravity, which lies in front of the tenth dorsal vertebra, is exactly over a line connecting the tuberosities the body balances without muscular effort. If, however, the body inclines forward the centre of gravity falls in front of the tuberosities and must be supported by the under surface of the thighs resting upon the front of the seat. If the body inclines backward there must be some point of support behind the tuberosities and this is found in the coccyx. If, however, the body leans either forward or backward, then the weight must be supported by complicated muscular action unless some additional means of support is furnished. The chair back gives this in the backward position. In the forward position the body drops forward, according to Fehrner, by a series of jerks until the weight is caught by the elbows resting upon the desk. In the forward position there is a decided tendency to vicious attitudes, the tendency being to hang the body from the shoulders rather than let the

ILL-FITTING DESK AND CHAIR.

arms hanging from the shoulders rest easily upon the desk. In the prevention of bad attitudes in the forward position the size of the chair seat, the "difference," the "distance" and the desk slope are of considerable importance as well as the chair back.

In maintaining correct attitudes in the backward position the chair back is of the utmost importance. As recognized by the Vienna Commission there are three types of seat backs. The first is the low pelvic support, the second the lumbar, the third the dorsal. These, of course, may be combined.

Meyer favored the pelvic support because by fixing the base of support for the whole spine it favored an upright position. He considered the last vertebra the most advantageous point of support. Though regarded by him as unnecessary there may be added a dorsal continuation of his back support, short and at the same time inclined very sharply backward. Cohn and Hermann agree essentially with Meyer. Meyer objected very strongly to any high straight back because it forced the child to slide forward on the seat.

Through the work of Lorenz and Schenk the reclining seat back is now generally used with an inclination averaging about ten degrees. Both of these authors advocate writing in the reclining position, Lorenz at first advocating a desk slope rather more steep than experience has shown to be practicable. Lorenz and Meyer insist much more strongly than Schenk on the necessity of having a firm lumbar support. Many seats have been constructed with a lumbar support alone, having in view as the main object the maintenance of the normal lumbar curve. One back deserving particular mention is that of Holscher, in which two supporting pads, a transverse lumbar and a perpendicular dorsal, are placed upon an upright rod, the whole inclined backward and adjustable for height.

In spite of all the work which has been done in regard to the chair backs they still remain the weakest point in even the best of the modern school furniture built in this country. It is evident that children with strong backs can get on with no support, especially if the sitting hours are properly regulated, but weak muscles are not uncommon among school children and the best possible support should be furnished. Such support is given by a chair in which faulty positions would be less comfortable than correct ones. Children require a change of position as a relief, and it is desirable that such a change be furnished without tempting the child to attitudes in which the back is less favorably supported.

If children seated, but tired of sitting, are watched, it will be noticed that they either lean upon the desk or slide down upon the chair, to take as far as possible a reclining position, to relieve the downward pressure upon the pelvis and the strain upon the lumbar ligaments and fascia or by twisting the trunk and sitting to one side or the other, relieving one set of muscles temporarily at the expense of a strain of the others. The photographs taken by Scudder in the public schools show admirably the faulty positions assumed as a result of fatigue and improper seating. Although these positions may be assumed without harm for a short time, yet if constantly taken a habit is developed dangerous in growing children.

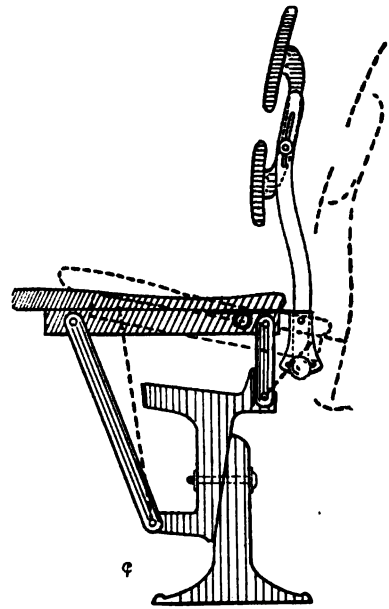


DIAGRAM OF MODIFIED MILLER CHAIR, ALLOWING CHANGE OF POSITION WITHOUT LOSS OF BACK SUPPORT.

The danger from leaning upon the desk is minimized by a proper construction, properly adjusted height and slope of desk, which with a sufficiently narrow seat will diminish the tendency to a twisted position of the trunk, particularly if the height of the seat is properly regulated. Here also the general introduction of vertical script has been of marked benefit.

The tendency to slip down in the chair and to assume an inclined position is but imperfectly met by foot rests and by hollow-

ing the seat so that the buttocks do not readily slip forward. The tired child will instinctively attempt to assume an inclined position as a relief. This should be made possible as far as practicable without depriving the child of the support that is desired in the lumbar region.

A series of back tracings in various sitting positions shows the great change occurring in the lumbar curves and the need of firm lumbar support. Whether the child slides forward on the seat in a reclining position, or leans forward on the desk, or simply doubles up and holds the book in his lap, the normal lumbar concavity is replaced by a convexity. When the child slides forward and then leans back the lower lumbar convexity is less marked, because in this position the pelvis becomes fixed when the coccyx touches the seat, but at the same time the head is carried forward by an increased upper dorsal convexity. Leaning forward on the desk diminishes the normal dorsal convexity, although the lumbar convexity is as marked as in other bad positions. It is essential for a suitable school chair that it should furnish support in the lumbar region, that it should not press the shoulders forward and that a change from a vertical to an inclined position be possible without a loss of lumbar support.

With a view to allowing a change from an upright to a reclining position, Miller has constructed a chair on entirely new lines. The chair of Hippauf, already mentioned, had the seat attached to the base by links parallel and of equal length. Miller substituted iron castings for the wooden links, made the front one much longer than the rear one and placed them at such an angle that they diverge several inches at the top. Thus this chair gives what no other chair has ever given, the ability to move forward into an upright and well-supported position for writing and the ability to slide away from the desk a few inches into a well-supported reclining position for reading.

The back of this chair, which is at slightly more than a right angle with the seat, carries two transverse supports, a lumbar and a dorsal. Each is adjustable for height. The former can be moved forward and back as well.

These adjustments in the back are a great gain over the ordinary chair back. Another marked improvement is seen in the modern spring-back typewriter's chair, having a back support adjustable for height and at an adjustable angle with the seat. The latter mechanism is in some ways more satisfactory than the back

of the Miller chair, which, however, has the advantage of a forward and back adjustment of the lumbar support.

By combining the seat and castings of the Miller chair with the spring back and by replacing the two adjustable pads of the Miller chair and the single pad of the typewriter's chair with a combined dorsal and lumbar pad swinging like a mirror with the long arm uppermost, the advantages of each are secured. In such a combination chair there are secured four automatic changes, by far the most important that from the upright to the reclining position; second, that in the distance from the desk; third, that in the angle between the body and thighs, and, fourth, that in the back supports to conform to changes or individual variations in the curves of the spine.

There are other fixed adjustments, one of importance being that for seat height and others being for height and angle and strength of spring of back supports. In ordinary use all of these adjustments might not prove necessary, although those least simple are the ones in actual use in the very popular typewriter's chair.

In the combination proposed there are secured automatic changes in distance from the desk and in the position of the body as a whole. There are also possible automatic changes in the back supports. At the same time the lumbar spine always receives firm, the dorsal spine sufficient, support, no matter what the occupation of the scholar. The fact is recognized that improper attitudes result from fatigue and that fatigue must always follow any attitude, no matter how satisfactory in itself, which is long maintained without change.—Boston "Medical and Surgical Journal," October 15, 1899.

SCHOOL SANITATION.

From *Fairhaven Star,* Sept. 9.

School boards, intrusted with the lives and health of the children as well as with the public money, should be held responsible for the kind of buildings erected, for intelligent public opinion now believes that it is quite as important that pure air and pure water be supplied for the children as that excellent teachers be provided and far more important than that free text-books, tablets and pencils, which are often a menace to the health, should be furnished.

For years school boards have taken precautions against fire and the spread of contagious diseases, which produce immediate and marked results, but only within a few years has it been understood that certain environments, which tend to diminish vitality and hence lessen achievement, are in even greater need of scientific supervision.

An eminent authority says "the foundation of all diseases (the tendency to which is not inherited) is in 95 per cent. of the cases laid before the age of 20 years, and the cause of 98 per cent. of this number may safely be laid at the door of the poor sanitary conditions of the schools and homes and the ignorance or carelessness of the parents and teachers of sanitary laws."

Nearly all of the laws affecting the health of school children are of recent origin. In the last published report of the United States Commissioner of Education is a very interesting chapter upon the "Sanitary Legislation Affecting Schools," which every parent and taxpayer should read and mentally digest.

A few facts gleaned from the report may be of interest. Nine subjects only have been legislated upon by the States: Inspection of buildings, vaccination, protection from fire, from contagious diseases, sanitary ventilation, seats and floor space, barbed wire and nuisances.

Seventeen states, led by Massachusetts, provide for the inspection of schoolhouse plans or buildings by some higher authority than the local board. The same number enact similar laws in regard to vaccination. Sixteen states have more or less protection against fire. Twelve states, including Minnesota, have the usual legislation for protection against contagious diseases. The District of Columbia, the very heart of the nation, legislates only upon vaccination and protection from fire.

Massachusetts and Connecticut are the only states that present a standard of ventilation and require enforcement under legal penalty. Pennsylvania and New York provide for the circulation of plans for school buildings with "healthful ventilation," and California, through its State Superintendent, instructs its teachers to keep the schoolrooms ventilated, which is about as specific as for a physician to say to an ordinary attendant, "Give this patient nutritious food."

Kentucky's legislation is very helpful, and the history of how she came to take such an advanced position in legislation in regard to school building and furnishing would be most interesting.

There must have been a very wise presentation of the subject to have persuaded the legislature to pass laws so far in advance of any other state. "The county superintendent," says the Kentucky legislature, "shall condemn any school building which is dilapidated, unhealthy or otherwise unfitted to be occupied for the purpose of a common school. He shall condemn all school furniture or apparatus insufficient in quantity or not of the required character, and order the same replaced with proper furniture and apparatus. He shall visit at least once a year each school, and at the time of his visit note in a book kept for this purpose the condition of the schoolhouse, furniture, grounds, etc., and shall admonish the teacher found remiss in the matter of cleanliness of the house and ventilation of the same, and shall complain to the trustees in cases of gross neglect in these respects." In regard to construction of school buildings the law says: "Each schoolhouse hereafter to be erected shall have a floor space of not less than 10 square feet to each pupil in the district, and there shall be at least 10 feet between floor and ceiling. The trustees shall furnish each child a seat, patent or otherwise, with a back; the height of seat and back to suit the age of the child. They shall also provide a supply of good water." And Kentucky is the only State that legislates at all in regard to the lighting of schoolhouses, to the water supply, to seating children and upon the air space to be allowed to each child. When it is considered that overcrowding a room with pupils may render any system of ventilation ineffective, it certainly seems strange that Kentucky alone has any legislation upon the proper seating of schoolhouses.

The compiler of the statistics says, "It is evident from the laws concerning sanitation that the United States as states has done comparatively little for this important phase of educational work, when only about one-third of the states and territories require vaccination, one-third take some slight precaution against fire, one-fourth guard the school children from contagious diseases, one-sixth require suitable sanitaries, two insist upon ventilation, and one state prescribes the air space allotted to each pupil and the proper seating of the school buildings. Yet existing legislation is along right lines, and future progress will be expansion rather than reform."

MICROBES IN THE BEARD.

In the earliest and perhaps the best of all "Books of Nonsense" the reader was entertained with the embarrassment of a certain "Old man with a beard, who said it is just as I feared"—the apprehension thus realized being that the fowls of the air would build their nests in the tempting thicket of hair which depended from that old man's chin. The beard of real life does not, of course, afford such ample harborage for the feathered race as this. Its invasion and appropriation by "two cocks and a hen," "three larks and a wren," is not really to be feared; yet it may, it appears, have tenants of an infinitely smaller size, but of inversely proportioned powers of mischief.

Dr. Schoull, of Tunis, has discovered that it is simply a happy hunting ground of bacilli. He has proved it upon the guinea pig, whom he has inoculated with the "material obtained from beards and mustaches," with results distressing to the guinea pig and alarming to all those who had been in more or less contact with the beards and mustaches aforesaid. This is a very disagreeable discovery and may seriously affect the popularity of a form of facial adornment which has hitherto been regarded as open to no other objection than that it is a nuisance to its wearer when in the act of taking soup.

But what are a few stray shreds of vermicelli compared with a whole army of able-bodied baccilli lying in ambush for their victims, and, what is more, ready to make victims of anybody who happens to come within their range? No wonder Dr. Schoull insists on the thorough disinfection of all beards and mustaches which their wearers refuse to remove. The next step to be taken by the Royal Society for the Prevention of Tuberculosis is to require all persons who have been certified as suffering from consumption to be clean shaven, a well-skilled barber being for that purpose added to the staff of each one of the new sanatoria for tuberculosis which are shortly to be built throughout the country. Who is to protect the well-skilled barber is a question on which we are not informed, or even as to who is to disinfect him before operating on a patient who has not suffered from consumption. Until, however, some provision is made for this, his "Next, please," will

have a very ominous sound. Mentally completed, the phrase would run, "Next candidate for tuberculosis."

On the whole, we cannot but hope that the learned Dr. Schoull is mistaken. Perhaps the guinea pigs who were inoculated with the doctor's "material obtained from beards and mustaches" were ailing to start with, or perhaps the material itself became impregnated with the germ from some external source. Or, possibly, the beard itself was really like the old man's in the nonsense rhyme, and a mare had made her nest there, to be afterward found by Dr. Schoull.—London "Telegraph."

CONTINUED LEAD POISONING IN LOWELL FROM WATER PIPES.

Many Dangerous Cases.

The Board of Health and the citizens of Lowell have been again admonished of their dangerous water distribution. At a meeting of the Board of Health September 26th the following communication was submitted:

Office of the State Board of Health,
State House, Boston,
Sept. 25th, 1899.

To the Board of Health of the City of Lowell:

Gentlemen:—Since June, when the State Board of Health notified you of the danger to the citizens of Lowell from using the public water supply drawn through lead pipes, the board has been informed by physicians in Lowell of 33 new cases of lead poisoning, some of which are very serious.

It now appears from the reports of these physicians, who comprise but one-fourth of the whole number of physicians practicing in Lowell, that in their practice there have occurred since the 1st of January, 1899, the following severe cases of lead poisoning, namely: Nine cases of partial paralysis of the legs; 10 cases of partial paralysis of the hands and wrists, and 25 cases of lead colic, besides many cases of the milder effects of lead poisoning, which were arrested by treatment and discontinuing the use of city water.

Further examinations for lead in the water upon the south side of the river show very dangerous quantities existing in the

water running through the pipes when in ordinary daily use. These quantities of lead average much higher than those found last year, indicating an increased action of the water upon the pipes from year to year.

As before, the water of the Cook and Hydraulic wells has a more rapid action upon the lead than the water from the Boulevard wells. The amount of lead found in water from the Cook and Hydraulic wells when drawn in houses supplied by lead pipe during the hours of ordinary daily use, during the past five months, has averaged 0.41 of an ounce of lead in 100,000 ounces of water, or one quarter of a grain per gallon, which is eight times as much as we regard a dangerous quantity; and in the opinion of the board, the health of a large portion of the people of Lowell is seriously endangered by using, for drinking and cooking, water from the Cook and Hydraulic wells drawn through lead pipe. Nowhere else in the State do we find a public water supply acting so rapidly upon lead pipe and with such pernicious results; and we advise that measures be taken without further delay to prevent the continued use for drinking and cooking of this water drawn through lead pipe.

Water from the Boulevard wells dissolves lead much less rapidly than water from the Cook and Hydraulic wells; in fact, the examinations for lead in water in Centralville, where none but Boulevard well water enters the pipes, indicate an amount, when running in ordinary daily use, so small that we should not regard it as a menace to the public health, and we have learned of but one case of lead poisoning in Centralville.

On the south side of the river, six cases of lead poisoning were found where the water, at the time of examination, was Boulevard well water, and some of this water contained dangerous quantities of lead, but it is probable that at other hours of the day or night these pipes receive Cook well water, which may so affect the lead that the Boulevard well water, when it passes through, takes up more lead than it would if the pipes were exposed to its action alone.

Water from the Boulevard wells, after standing in lead pipes over night, contains dangerous quantities of lead, and all such water should be wasted before drawing water for cooking, and water for cooking should not be drawn at any time from the lead hot-water pipes. With these precautions carried into practice, the Boulevard well water can at present be used without danger

from lead poisoning with the ordinary length of service pipe; and this water is as good in other respects as that from the Cook and Hydraulic wells.

To guard against lead poisoning to an appalling extent in the city of Lowell, two courses appear to be at hand: One is to remove all lead service pipes through which water from the Cook and Hydraulic wells is drawn for drinking or cooking, and the other is to cease using the Cook and Hydraulic well water and extend the Boulevard well system to supply the whole city. The public health requires that one or the other remedy be applied as soon as possible.

By order of the board,

SAM'L W. ABBOTT,
Secretary.

At a conference of the water board, October 3, the president expressed his satisfaction with the test of one set of chemists. The state board has spent $1,000 in the Lowell experiments. The water board has engaged a chemist who will go to the very bottom of the matter from the time the water leaves the source until it reaches the humblest man's home.

Dr. Packer said it should not be a matter of money, that is a secondary consideration. Lowell has got to have good water.

President Weaver said he could give many instances of what the people think. He had three neighbors who had lead poisoning, and it was not a pleasant thing to be asked every day, "What are you doing?" There are others who say, "Pay no attention to it; there is nothing in it." Personally, he did not believe that over 75 per cent. of the people took any stock in the lead poisoning reports. But that made no difference as to what should be done.

The purport of the general statement of Mr. Weaver, however, was continued deliberation, whatever might be the facts, and that little or no relief can be expected within a year, at least.

The time of LIFE is short;
To spend that shortness basely, were too long
If Life did ride upon a dial's point,
Still ending at the arrival of an hour.

—*Shakespeare.*

MEDICAL EXCERPT.

By T. P. Corbally, A.M., M.D.

Renal Lithiasis in Infants.—M. Comby ("Le Progrès Médical," August 12th), addressing the Congrès Français de Médecine Interne, remarked that Parrot had pointed out the yellow stric of urates found in the pyramids of the kidneys of very young children. M. Comby has attempted to verify this fact, and has found it in forty-eight autopsies of children whose age varied from three days to two years. His experiments showed that the younger the children the more frequently the urates were found. He attributes this disturbance to faulty nutrition, to gastro intestinal trouble and to the premature weaning of children. The author has also found, in some cases, besides gravel and renal calculi, vesical calculi, pyilitis and even hydro-nephrosis. The diagnosis in these cases is very difficult, and the only treatment that can be suggested is careful watching and the improvement of the nutrition.

Gaiacol Bandages.—The same journal gives the following conclusions of M. Moncorvo, of Rio de Janeiro, in the differential diagnosis in cases of malarial and tubercular fever, a subject in which he has taken much interest:

1st. The antithermic action of gaiacol synthetique—alpha—employed externally as poultice or bandage is energetic and very prompt in reducing tubercular fever, while almost always there is no such result from its application in malarial or marsh fever.

2d. This difference in its action gives gaiacol undoubted value in determining the differential diagnosis between tuberculosis and miasmatic infection.

Abscess of the Liver.—The same journal also reports the case of an abscess of the liver in a child two years of age. An incision was made in this case according to the method described by Little, and a complete cure followed the operation. The child fell, causing a severe contusion in the right hypochondriac region, about two months before the abscess formed.

Having eliminated the hypotheses of hydatic cyst, of the presence of lumbricoid worms in the biliary ducts, of an umbilical phlebitis, of appendicitis, of typhoid fever and of dysentery, M.

Moncorvo fixed an abscess of the liver due to traumatic cause as the case he had to treat.

THE ALCALOIDAL HABIT.—At the Congrès Français de Médecine de Lille, 1899, what may be called the medical habit or the accustoming the system to the use of medicinal agents, by long usage, was discussed at great length. Age, sex, temperament were considered and then a very large class of medicinal agents.

MM. P. Claisse and G. Brouardel reported on alcaloids: "We undertook, in 1897, to make some experiments on accustoming the system to alcaloids (l' accoutumance aux alcaloïdes). We proposed to compare the effect of these vegetable poisons with the microbe poisons, thinking that it might be possible to find a therapeutic serum, if the system could be accustomed to tolerate their use. We experimented for this purpose with strychnine, aconitine, and Dr. Chavigny gave us his notes on morphine and nicotine.

"For strychnine we endeavored to take advantage of the immunity afforded by its combination with other substances as *escargot*, but we found that the delay in causing the intoxication depended on the substances combined with the alcaloid.

"We made special efforts to accustom animals gradually to increasing doses of the alcaloids, in order to determine later if their serum possessed the properties of an antitoxine. For strychnine and aconitine, continued use had no effect, or, at most, so feeble that it could not be appreciated at the end of a month. For morphine and nicotine the habit was more easily acquired. But then, even in the animals that became enabled to tolerate large doses, the blood did not acquire the properties of an antitoxine.

"There are poinsons taken from the vegetable kingdom for which tolerance may be acquired; thus, M. Calmette has shown that abrine has this property and one of ourselves has proved it for phalline. But these poisons are more nearly related to the microbes than to the alcaloids.

"Finally, it seems improbable that an antitoxine serum can be derived from the alcaloids by accustoming the system to the use of large doses."

PSYCHICAL EFFECTS OF CAFFEINE.—M. Leduc ("La France Médicale," Sept. 29): "Caffeine not only produces acute and violent delirium in patients to whom it is given in large doses, but, used in small quantities prolonged, without observing results, it may produce a very painful condition, giving rise to a special form

of melancholy, in which the patient gives way to attacks of despair, accompanied with tears which may, in some cases, lead to suicide. It should be remarked also that this condition may last for a long time after the use of the agent has been discontinued."

THE PATHOGENESIS OF CANCER.—Dr. Robert Bell, of Glasgow, ("Medical Record"—International Congress of Gynecology and Obstetrics), presented a communication with this title. The author mentioned the ovum as an example of a cell leaving one organ and proceeding to another, where it took on a new and rapid growth and entered on a new phase of existence by virtue of its environment. If the transmigration of one cell could take place, it might occur in other than physiological circumstances. Indeed, he said, it frequently was observed pathologically when glands became involved in disease which had previously existed in a neighboring or even a comparatively distant tissue. Why, then, should not the same rule apply to cells having at the moment no pathological or even pathogenic significance? He remarked that if a cell possessing in its original environment an activity normally high found its way into an organ which for some cause or other has had its health —it may be only temporarily—depressed, the invading cell became enabled to enter on a new phase of existence, and by preying upon its host to develop a progeny which possessed quite different proclivities from those they would have possessed had they been the offspring of their parent cell had it continued in it normal sphere of existence. It had been placed beyond doubt that the ovaries and mammæ were in communication through the lymphatics, and the author was inclined to suppose that an ovarian cell was thus enabled to find its way to the mamma and there become the focus of scirrhus. He was quite at variance with those writers who supposed that cancer was due to a parasitic entity which in any way was developed external to the economy. He then endeavored to show how epithelial cells might, and in all probability did, depart from their normal condition in certain circumstances and in their transition became malignant, and how this untoward result might be avoided, and when it had actually occurred be undone. The speaker then pointed out that in carcinoma of the cervix frequent mistakes were made in diagnosis, and in many instances when no cancer existed an unnecessarily pessimistic view was taken.

CONTAGION AND INFECTION.—T. A. Grigg, M.D. (Philadelphia

"Medical Journal," Sept. 14), discusses the significance of these two terms, quoting various authorities as to their usage, and concludes that from his standpoint "an infectious disease is produced by a pathogenic micro-organism that lives and propagates in a suitable soil on the outside and independent of man, but when taken into the system and absorbed is capable of producing certain diseased conditions which are not directly transmissible from patient to host; while a contagious disease is produced by a pathogenic micro-organism that propagates in the afflicted patient and which, after escaping from said patient without undergoing further change and on being taken into the system of a prospective host and being absorbed, is capable of producing certain diseased conditions and is transmissible from patient to host either directly by contact or indirectly as by fomites." He thinks it is of some importance to make this distinction clear.

STATE UNIFORMITY OF REQUIREMENTS FOR LICENSE TO PRACTICE MEDICINE.

This eminently desirable object is earnestly pushed by the committee of the Wayne County (Michigan) Medical Society, appointed for the purpose. The committee reports that, in reply to circulars sent to the authorities in 51 States and Territories, favorable replies have been received from 34. Others are anticipated. Hence it appears that needful legislative action by the several States and Territories now depends upon the action of the medical societies throughout the country for the evolvement of such a code as will secure co-operation and energetic effort on their part to secure legislative action. For the promotion of the purpose correspondence is invited by the secretary of the committee, E. AMBERG, M.D., 32 W. Adams ave., Detroit, Mich.

MR. SHIVVERS TRIES HEROIC TREATMENT.

"Um-m-m!" said Mr. Shivvers, thoughtfully, laying down his paper. "I believe there is something in that."

"In what?" asked Mrs. Shivvers.

"Why, in their 'Health Hints for the Helpless' they say that the reaction and after glow of cold morning baths is an infallible cure for neuralgia and rheumatism," explained Mr. Shivvers.

"Cold water right out of the spigot, without any warm water at all?" cried Mrs. Shivvers.

"Certainly," replied Mr. Shivvers.

"O-o-o-oh! I couldn't," shuddered Mrs. Shivvers.

Mr. Shivvers smiled a superior smile.

"Of course it is rather heroic treatment, and requires considerable moral as well as physical courage, but to a man convinced of its efficacy that is of no consequence," he said, complacently, "and I certainly shall give it a fair trial. Besides," he continued, fortifying his sudden resolution, "it is not one sudden freezing plunge, but a gradual immersion while you very slowly count six. Like this: one, and you put in one foot; two, you put in the other; three, you sink upon one knee; four, you kneel on both; five, you plunge in your arms; and six, you immerse your body. So, after all, it is not so very dreadful. Yes, I shall certainly try it to-morrow morning."

However, Mr. Shivvers did not seem so enthusiastic in the morning. His wife let the cold water run, according to his instructions, until the tub was full to overflowing, but, in spite of reiterated information to that effect, he still lingered in bed.

"Jeremiah," cried Mrs. Shivvers at last, from the bureau, where she was doing up her hair, "this is the eleventh time I've called you, and you just must get up. You'll be late for breakfast as it is. You needn't try that bath if you are afraid of it," she added, with a laugh.

Slowly and reluctantly Mr. Shivvers crept out from under the warm covers, silently casting a look full of reproach upon his smiling spouse, and into the bathroom, with the laggard step of one who has something weighing upon his mind. Then there was a long, a very long, wait. Nor was it until his wife had several times exhorted him to "Hurry up, Jeremiah!" that she heard him say:

"O-o-o-one. Ouch! Gosh!"

Then there was another wait and another exhortation.

"T-t-t-t-twoooo. Ow-ow-ow-wow!"

Another wait and exhortation.

"Th-th-th-th-th-three-e-e-e-e-e," next came chattering from the bathroom, immediately followed by a blood-curdling shout and a tremendous splash. Then there was a succession of agonized yells, and what Mrs. Shivvers at first took for a streak of lightning flashed out of the bathroom, plunged into bed and rolled itself tightly up in the covers.

"Why, Jeremiah!" gasped Mrs. Shivvers.

Mr. Shivvers simply glared and shivered.

"Woman," he growled, when he could control his chattering teeth, "did you leave that cake of soap in the bottom of the bath tub on purpose?"—"Harper's Bazar."

EDITOR'S TABLE.

SANITARIAN, NOVEMBER, 1899.

☞All correspondence and exchanges, and all publications for review, should be addressed to the Editor, Dr. A. N. Bell, Brooklyn, N. Y.

THE RAMAPO WATER JOB.

Never in the history of New York, remarks the "Engineering News," have its citizens been more aroused and with more reason over a proposed contract between the city and a private corporation than they have since Aug. 16. On that day only a tie vote prevented the Board of Public Improvements from entering into a $5,000,000 a year water contract, extending over a period of forty years. With scarcely a breath of warning and without the shadow of an engineering report on behalf of either the city or the company, there was suddenly sprung upon the people, and almost railroaded through a brief session of the board, the most audacious contract ever submitted to an American municipality. The total sum involved runs into the hundreds of millions, especially if the accompanying estimates of future water consumption are correct. The yearly charge of $5,000,000 would pay 3 per cent. interest on works costing $166,000,000 of the same interest and a yearly staking fund charge of 2 per cent. on $100,000. The size of the annual tribute demanded from the city by the Ramapo Water Company and its allied interests can be better appreciated when it is remembered that only four years ago an investigation made for the City of Brooklyn by the late William E. Worthen showed that 100,000,000 gallons of water a day from the Ramapo could be delivered to the Ridgewood reservoir in Brooklyn at a cost of only $16 per 1,000,000 gallons, whereas the price under the proposed contract is $70 per 1,000,000 gallons for 200,000,000 gallons a day, or more, delivered in bulk at some indefinite point on the northerly line of the city, leaving New York to stand the expense of carrying the conduit to and beneath the East River and thence to the Ridgewood reservoir. While the two propositions may not admit of close comparison, there is an enormous difference between them, which can by no means be explained to the satisfaction of the taxpayers of Greater New York.

A work of this magnitude, entered upon so blindly, absolutely without competition, is simply unprecedented in the history of engineering and municipal public works, and it is made all the more notorious because it is proposed at a time when the most marked feature of municipal administration is the insistence on getting and keeping public water supplies under municipal control. Only nine of the fifty largest cities of the United States are dependent upon private companies for their water supply. Four of these nine have recently taken steps to change to public ownership.

PURIFICATION OF POTABLE WATERS WITH PEROXID OF CHLORIN. —The process recently invented by Bergé of Brussels ("Semaine Medicale," Paris, July 19, H. Borges), by which peroxid of chlorin, formed by the action of sulphuric acid on potassium chlorate, is used for purification of water, has been applied in Belgium on a small scale, with perfectly satisfactory results—Ostende, Middlekerke and a boarding school at Lombartzdye. It is also being tried at Liège, and a committee from the French Public Health Department has been investigating it to determine its practicability for general use. The report of the committee is extremely favorable in every respect, although it advises waiting for longer experience with the system before introducing it on a large scale. To prevent danger of explosions the acid is diluted and cold; an aqueous solution of the peroxid is used and a current of air forced across it carries off any gas that may form. It not only destroys pathogenic germs in the water, but oxidizes the organic matters in a most remarkable manner, and generates ozone which also assist materially in the purifying effect. The disadvantages of the process are that the peroxid must be in excess in the water, which gives it a peculiar taste like Javelle water and stains it yellow. But the peroxid soon spontaneously vanishes—four hours—indicated by the disappearance of the taste and stain, or by tests with starch water and potassium iodid, and the vanishing process can be hastened by passing the water over coke, when it is at once ready for use. Another disadvantage is that the organic matters must not be too abundant in the water, or too much peroxid would be required, hence the process demands the previous filtration of much contaminated water. The expense for 3 grams of the chlorate, which produces 1 gram of the peroxid, sufficient to purify 1 cubic metre of water, is about $0.0006. The Traube system of purification of water with chlorid of lime,

which has been tried on quite a large scale with Nile water, requires the addition of sodium bisulphite to the water to remove the chlorin liberated by the process. The ozone method now on trial at Lille, endorsed by Calmette, is the only other important rival of the peroxid method of chemical purification.

WHERE IGNORANCE IS BLISS.

The Savannah "Press" reports some rather amusing experiences of the quarantine inspectors recently. One of them ran upon a colored minister and many of his congregation. They were all trying to come into the city under the protecting care of the "pahson." The minister was the only one of a dozen who had a health certificate. He vouched for his crowd, though, which was composed mostly of ricefield negroes. He called them all by name and said they belonged to his congregation. As all of them had boarded the train at a little station between Savannah and Jesup the parson's "recommend" went with the inspector and the whole crowd was passed through the lines. The minister's stock went up about ten points and he was looked upon as a very important personage since he had so much influence with the "white buckra gward."

Inspector Greene, on the Plant system, struck up with a peculiar case. He went into the car of the colored passengers and asked of a negro:

"Have you a health certificate?"

"Yes, sir," was the reply.

"Where is it?"

"Right here in my hat, boss. The conductor gimme one of dem t'ings every time I goes to Savannah," and he produced a little slip of red pasteboard about an inch across by an inch long, which was the conductor's private sign where a passenger was due to get off. The negro thought that was a pretty good certificate, but the inspector made him show up more convincing evidence that he had not been to New Orleans or Key West. The negro seemed tickled to death that the inspector thought he might by any possible chance have traveled so far away from home.

"New Orleans," he said; "me been to New Orleans? Boss, I hab not money enough in ten years to get dat far away frum home. De buckra pay so little for work now all I can do to get to Savannah."

Greene let him pass.

Another inspector struck a white man who did not know there was any yellow fever anywhere; had never heard of New Orleans, and when asked for a health certificate looked vacantly at the inspector and said he did not know what he was asking for. The word certificate was Greek to him. This is a fact, and the man does not live a hundred miles from Savannah. And yet some people kick because the free school system is too large and liberal in Georgia.

THE GOSPEL OF SOAP AND WATER.

A very useful and vastly important work done by our army in all the Spanish possessions that have come under our sway, and one that carries with it little glory and attracts little attention, is the sanitary reforms we have forced upon easy-going and easy-dying people. In Porto Rico, Cuba and the Philippines our military authorities have been an army with scrubbing brushes and disinfectants, and cleanliness has been enforced at the point of the bayonet. Manila presented a specially hard problem, for the city had been besieged for months before it fell into our hands. Within its walls were crowded a population indifferent to vile smells and an army whose camps at the best times are examples of how not to do it. The task that confronted our medical corps to which sanitation was referred might have daunted the stoutest hearted. They were new to the people and the people were new to them, nor did the gospel of soap and water have any charms to the Manila masses. Still our doctors went to work with a will, and what they accomplished is well set forth by Surgeon Bourns, of Georgia, who recently returned to Atlanta from sixteen months' army service in the Philippines. Dr. Bourns says:

"One of the very first problems I had to deal with was to clean the city and inaugurate proper sanitary laws. This I at once set about doing. I had the city cleaned and put in as good sanitary condition as possible. I also established a system of quarantines in order to keep out all infectious diseases. Then we had probably our greatest problem to deal with—that of smallpox. The city was full of the disease, and we went to work to establish a vaccination farm. We took the Spanish army and vaccinated every man in it. After that was accomplished we started out and vaccinated every man, woman and child in the entire city. We established isolated hospitals, where we sent all cases of the disease, and went at the work to treat it as it is treated in this country. We also estab-

lished a veterinary hospital and instituted city physicians and meat inspectors."

As the result of this unremitting labor by surgeons who had to attend to hospital duty too, the city is, in Dr. Bourns' judgment, in a fairly good sanitary condition. He thinks the Filipinos will take kindly to sanitation after the fighting is ended, and that the close of the dry season, say early in the spring, will see us conquerors and ready to carry our cleaning operations into the other cities of the Philippines.

MORTALITY AND MORBILITY REPORTS AND REVIEWS.

NEW YORK, 7,110,000. The State Board of Health has recently been making an effort to ascertain more accurately than heretofore the total number of deaths that occurred in the State for each calendar year from 1887 to the present time. These numbers differ from those given in the monthly and annual summaries of this board, because they include many certificates received too late to be included when the earlier tables were made up.

Deaths in New York State, 1887-1898.

1 Year.	2 New York.	3 Brooklyn.	4 Buffalo.	5 Albany.	6 Yonkers.	7 Rest of. State.	8 Total.
1887	38,933	17,078	4,688	2,026	558	42,404	105,687
1888	40,175	18,061	4,929	2,340	599	48,480	114,584
1889	39,679	18,480	4,328	2,276	573	47,021	112,357
1890	40,103	19,827	5,024	2,279	588	50,234	118,055
1891	43,659	21,349	6,001	2,390	588	54,671	128,658
1892	44,329	20,807	5,697	2,564	741	57,250	131,388
1893	44,486	21,017	5,711	2,142	687	55,616	129,659
1894	41,175	21,183	5,280	2,180	796	52,769	123,383
1895	43,420	22,568	4,684	2,343	787	53,084	126,886
1896	41,622	22,501	4,452	2,106	758	53,013	124,452
1897	38,877	20,593	4,475	2,016	743	51,821	118,525
1898	40,438	21,989	4,533	1,903	752	52,969	122,584

It will be noticed that the largest number of deaths occurred about midway in the twelve year period, the years 1891, 1892 and 1893 having been very unhealthful. From this table, however, it is not clear which years were most healthful. To be sure, fewest deaths were recorded in 1887 and 1889, but the population of the State now is much greater than it was then, and from a larger

population one naturally expects a greater number of deaths. In order to decide which period was the most healthful it is necessary to allow for this increase of population. To do this in New York State is unusually difficult because of the doubt concerning the accuracy of the last two enumerations of population, those of June, 1890, and February, 1892. Probably both of these enumerations outside of New York City and perhaps Brooklyn were sufficiently accurate for our purposes. But it is incredible that the true population of New York City could have been as reported in June, 1880, 1,206,299; June, 1890, 1,515,301; February, 1892, 1,801,739; April, 1895, 1,851,061.

It could not have increased only 300,000 in ten years, then nearly 300,000 in the next twenty months and then only 50,000 in the following thirty-eight months.

We must assume that the second of these four enumerations was an undercount, the third an overcount and that the first and last counts were accurate. On this assumption, the true population in 1890 may be estimated from that in 1880 and 1895.

For our purposes, again, the arithmetical method of estimating population, that is, the method of assuming that the increase in any year was one-tenth the increase in the ten years, will be accurate enough. In this way the population for the middle of each calendar year, *i. e.*, June 30, has been estimated.

Death Rates in New York State, 1887-1898.

1887, 18.3; 1888, 19.4; 1889, 18.8; 1890, 19.4; 1891, 20.8; 1892, 20.9; 1893, 20.2; 1894, 19.0; 1895, 19.2; 1896, 18.6; 1897, 17.4; 1898, 17.7.

This shows at once that the most healthful years in the twelve were not the first three, as might have been inferred, but the last two, because then the proportion of deaths to population was the lowest.

In the July bulletin it was shown that in this State the years 1891, 1892 and 1893 were more unhealthful than any other of the last twelve and that 1897 and 1898 were more healthful than any preceding.

The causes of the high death rate in this State in 1891 and 1892 were effective, especially in April, 1891, October, 1891, to January, 1892, inclusive, and July, 1892. On examining the returns for deaths by causes it appears that in April, 1891, there were 4,357 deaths reported from acute and respiratory diseases, while the

largest number for that month in any other year was 2,943. Similar evidence may be found in explanation of the high mortality October, 1891, to January, 1892, while July, 1892, was characterized by an unprecedented mortality of young children. Over six hundred more deaths of children under five were reported in that month than in any other during the eleven years.

Now April, 1891, marked the climax in this State of the second and most fatal epidemic of influenza, while a third epidemic began in November of the same year and reached its climax in January, 1892. Children's diseases and deaths were especially common in July, 1891, and July, 1892. The main reason, then, for the abnormally high death rate in this State and presumably in those adjoining us, in 1891 and 1892, was the coincidence between severe epidemics of influenza prevailing during the cooler months and attacking especially adults, and digestive diseases prevailing during the hot months and attacking especially children.

For the month of August, '99, compared with the preceding month, the annual death rate per 1,000 population from all causes has fallen from 18.7 to 17.1; there were 1,300 fewer deaths reported than in August, 1898, and 800 fewer than the average of the past ten years. Allowing for delayed returns, the death rate would not exceed eighteen per 1,000 population, the average for the past ten years having been nearly twenty. For the three summer months there has been an average daily mortality of 334, against 341 in 1898.

The infant mortality is one-fourth less than in July, and 37 per cent. of deaths have occurred under the age of five years against 42.5 per cent. in August, 1898, the saving being mostly in the maritime district. The zymotic mortality follows nearly the same relative proportion, being diminished in the districts having large city populations and increased, from July, in the other districts.

Of the zymotic diseases typhoid fever and whooping-cough have increased. The former caused 156 deaths against 94 in July and 181 in August, 1898; it has increased in all of the districts from last month. Whooping-cough caused 120 deaths, August being uniformly the month of its largest mortality in this State, but it has had a smaller mortality than last summer. From diphtheria 170 deaths are reported against an average of 270, there having been a constant decrease yearly in August for four years; there were but 37 deaths from it outside of the metropolis.

Diarrhœal diseases caused 15 per cent. of the mortality of the

month, against 18 in July and 20 in August last. In the rural towns of "rest of district" the diarrhœal mortality was doubled from July, while in the five large cities it was diminished by nearly one-half, the incidence of these diseases being upon the late summer in the country and upon the early summer in the cities.

Except for a recently reported case in Horseheads, Chemung County, probably originating out of the State, there is no smallpox known of in the State at the time of this issue.

Of 230 deaths from violence 56 were from drowning, 34 from railway accidents, 25 from suicide, 5 lightning stroke and 3 from hydrophobia.

There was marked equability of temperature with the normal average of 72 degrees, an unusual number of clear, sunny days, which has characterized the entire summer (only 20 cloudy days in the 92) and a deficiency of one-half from the average rainfall, that of August being especially small.

City of New York, 3,550,053: Total deaths, 5,363; annual death rate, 18.4; deaths under 5 years, 2,345; from cerebro-spinal meningitis, 31; typhoid fever, 63; scarlatina, 17; measles, 33; erysipelas, 10; whooping-cough, 77; diphtheria, 128; diarrhœal diseases, 652; consumption, 639.

Borough of Manhattan, 1,953,569: Total deaths, 2,861; death rate, 17.8; from cerebro-spinal meningitis, 23; typhoid fever, 27; diphtheria, 66; phthisis, 374; percentage of deaths under 5 years of age, 43.

Borough of the Bronx, 163,537: Total deaths, 325; death rate, 24.1; from diphtheria, 8; diarrhœal diseases, 32.

Many large institutions raise the death rate.

Borough of Brooklyn, 1,231,548: Total deaths, 1,751; death rate, 17.3; from typhoid fever, 27; diphtheria, 49; phthisis, 193; diarrhœal diseases, 250; percentage of deaths under 5, 53.1.

Borough of Queens, 134,139: Total deaths, 279; death rate, 25.3; from diphtheria, 5; diarrhœal diseases, 42; phthisis, 18; percentage of deaths under 5, 45.1.

Borough of Richmond, 67,260: Total deaths, 147; death rate, 24; from phthisis, 7; percentage of deaths under 5, 52.4.

Albany, 100,000: Total deaths, 127; death rate, 15.4; from typhoid fever, 4; diarrhœal diseases, 13; phthisis, 16.

Troy, 65,000: Total deaths, 105; death rate, 19.6; from typhoid fever, 2; diarrhœal diseases, 21; phthisis, 13.

Utica, 55,000: Total deaths, 74; death rate, 16.3; from diarrhœal diseases, 14; phthisis, 9.

Syracuse, 120,000: Total deaths, 112; death rate, 11.3; from typhoid fever, 2; diarrhœal diseases, 11; phthisis, 2.

Buffalo, 360,000: Total deaths, 360; death rate, 14.3; from typhoid fever, 14; diphtheria, 4; diarrhœal diseases, 104; phthisis, 14; percentage of deaths under 5, 41.8.

Rochester, 175,000: Total deaths, 204; death rate, 14.2; from diarrhœal diseases, 38; diphtheria, 2; phthisis, 15; percentage of deaths under 5, 27.5.

Yonkers, 42,000: Total deaths, 80; death rate, 23; from diarrhœal diseases, 22; phthisis, 14; percentage of deaths under 5, 45.

Binghamton, 45,000: Total deaths, 74; death rate, 20; from diarrhœal diseases, 2; phthisis, 5.

Elmira, 40,000: Total deaths, 32; death rate, 10; from diarrhœal diseases, 5; phthisis, 3.

ALABAMA.—Mobile, Sept. 23.—At a conference in this city between Dr. H. R. Carter, of the Marine Hospital Service, and Dr. W. H. Sanders, the State Health Officer, on the 20th inst., Dr. Sanders turned over to the Marine Hospital Service the running of the State quarantine.

The quarantine inspection will, therefore, be in charge of the Marine Hospital Service, under the direction of Dr. McIntosh, the surgeon in charge at this place.

CALIFORNIA.—At a meeting of the State Board of Health, in Sacramento, Sept. 14, a resolution was adopted as follows:

"*Resolved,* That the State Board of Health consider the propriety of quarantining against human beings and domestic animals with tuberculosis entering the State."

The resolution excited considerable discussion, for the most part suggestive of ancient history with regard to infectious diseases when it was the general belief of communities that all such diseases were far-fetched, while they were purblind to their own suroundings.

When and whence tuberculosis first manifested itself in the human race in, or was first introduced into, California, are questions beyond the power of the State Board of Health to solve and their investigation would doubtless be a waste of effort as fruitless as that contemplated by this resolution.

For the purpose of ascertaining the sense of the medical profession of Sacramento in regard to this resolution, a reporter of the "Bee" was sent out to interview local physicians, and the following are some of the expressions of opinion elicited:

Dr. H. L. Nichols had thought over this matter a great deal, but did not believe in going so far as to exclude consumptives from the State. If the atmosphere and climate are such as to benefit persons afflicted with tuberculosis, he thought it would be inhuman to deprive them of that benefit. Certain precautions should be adopted against the spread of the disease at home. People afflicted with consumption should be compelled to make provision for themselves when outside of their homes and should not be allowed to expectorate on the streets.

Dr. G. L. Simmons thought the proposition wholly impracticable. "Consumptives and their immediate friends and relatives," he said, "compose fully one-fourth of our population, and it would be scarcely practicable under such circumstances to attempt to exclude consumptives from our borders."

Dr. W. H. Baldwin thought the idea a good one, but that "we should clean our own State first. If we are going to quarantine against consumptives coming here we should first quarantine against those we have here."

Dr. F. B. Sutliff said: "We are no more in danger from the consumptives who come from Massachusetts than we are from those who are native born, and to shut out strangers and not isolate our own consumptives would be but a half measure, which would be sure to fall far short of what is sought to be accomplished."

Dr. C. O. Cartwright said: "If this resolution were put into effect it would come home to nearly every one of us. Consumption is so very widespread that nearly every one of us has a friend or relative who is affected. Care should be taken at home not to allow the spread of the contagion. The affected person should have a towel of his own and a cup and drinking glass of his own. He should sleep alone, and no healthy person should use any of the things used by him. He should be particularly careful where he deposits his saliva, and the ordinance against expectorating on the streets should be strictly enforced. The thing of greatest importance is the care that should be taken around the home where there is an affected person, so that those who are not affected may not take the disease."

A few there were who were so unacquainted with the prevalence

of consumption in the State that they would have quarantine officers stationed on all the avenues of ingress with power to turn back every consumptive who would enter; that, in addition, every consumptive should be subject to rigid quarantine.

But the opinions above quoted are believed to be a fair expression of medical knowledge in California and elsewhere. It is inconceivable. in the light of present knowledge, that the spirit of the resolution should find tolerance anywhere.

San Francisco, 360,000, August, '99: Total deaths, 512; death rate, 17.06; from typhoid fever, 10; diphtheria, 5; consumption, 64; deaths under 5 years, 77.

Los Angeles, 103,000, September, '99: Total deaths, 98; death rate, 11.41; from typhoid fever, 2; cerebro-spinal meningitis, 2; phthisis, 26; deaths under 5 years, 10.

CONNECTICUT.—The Secretary of the State Board sums up 167 towns, 911,524, August, '99: Total deaths, 1,382, 13 more than reported in July, and 20 less than in August of last year, and 4 less than the average number of deaths in August for the five years preceding the present. The death rate was 17.5 for the large towns; for the small towns, 20.1, and for the whole State 18.1. The deaths from zymotic diseases were 442, being 32 per cent. of the total mortality; percentage of deaths under 5 to total mortality, 37.

DELAWARE.—Typhoid fever is prevalent in Wilmington. On a canvass of Fourth and Franklin streets, where the disease is most prevalent (Oct. 1), out of 401 dwellings 157 persons were ill, 72 of whom with typhoid fever, and 67 of these had used the water from a certain public spring.

The State Board Bulletin for September, the first number of a purposed quarterly issue, well says, in anticipation, as it were, of this outbreak of typhoid fever as the result of drinking foul water from a public spring: "A laboratory has in this day become a necessary function. Exact diagnosis can frequently be made only when the more refined methods of science are brought to the assistance of the physician. It will be the aim of these bulletins to bring before the physicians and people of the State the advantages which this laboratory is prepared to offer them."

But a still more important use of the laboratory should be the daily test of the purity of drinking water as a preventive measure against such calamities as the immediately preceding.

DISTRICT OF COLUMBIA.—287,462—87,030 colored, 5 weeks, Oct. 7, '99: Total deaths, 596; death rates, white, 17.24; colored, 31.19: 21.53; deaths from zymotic diseases, 159—typhoid fever, 33; phthisis, 71; deaths of children under 5 years, 219.

FLORIDA.—The yellow fever epidemic in Key West is gradually exhausting itself for the want of susceptible subjects. It has been suffered to run its course. The total number of cases from Aug. 31 to Oct. 6, the date of Surgeon-General Wyman's last public report, was 1,015, the number of deaths 51. The report for the week ending Oct. 7 gives the number of new cases 232 and 8 deaths.

"In his letter (Tampa 'Herald,' Sept. 13) Dr. Porter states that it is clear that the fever was introduced to Key West by the negligent inspection service of the Marine Hospital Service. Since that service took charge of matters it had been customary to respect its inspection and pratique on baggage and vessels. Henceforward all such inspection and certificates will be entirely ignored on all vessels and baggage coming from all Cuban ports. The most rigid precautions will be employed and no attention paid to the Marine Hospital Service.

"The Florida Board of Health has demonstrated (Tampa 'Times,' Sept. 18), that it is more successful than the United States Marine Corps, which has charge of the yellow fever epidemics in other States, says the Arcadia 'News.' The cases at Key West are directly chargeable to the United States authorities, and had it not been for the prompt measures taken by the State Board of Health, a serious epidemic might have resulted. No cases were contracted on the mainland of Florida, and the effective manner in which the case at Miami and the suspicious one at Port Tampa City were handled effectively demonstrate that the new health regulations are far better than the old shotgun quarantine system. Florida has added a new feather to her cap.

"Our Board of Health (Jacksonville 'Times-Union,' Oct. 4) has justified our most sanguine hopes, and yellow fever in this State but raises its head in any locality to be confined and stamped out [!], though we have found that Solomon was nearly right when he said that all men are liars."

> "Oh, wad some power the giftie gie us
> To see oursel's as ithers see us!"

There is probably no locality in the United States where the

receptive conditions for yellow fever: climate, nature of the soil and neglected sanitation have more generally obtained than in Key West.

The surface of the island is but eleven feet above sea level: the soil is composed of coral, reduced to an almost sandy consistence, commingled with a considerable proportion of decaying vegetable matter, for there is a luxuriant growth of chapparal and other native small growth continually shedding debris, which is left to soak and decay in a constantly waterlogged surface soil. There is no provision for the removal of waste, no house drainage; but, instead, crude and stagnant gutters under wooden sidewalks constantly polluting the soil. The situation is below the frost line, and that yellow fever has not prevailed here as constantly as it has in Havana has been more due to lack of population, exposure to the sunshine and winds than to any effort on the part of either State or local sanitary authorities.

Cases and deaths reported since our summary, Sept. 13 (up to which time there had been 248 cases, with 7 deaths), to Oct. 10, inclusive, 625 cases, with 26 deaths. During the same interval there have been several cases, one fatal, at Miami and one case at Tampa.

ILLINOIS.—Chicago, 1,650,000—23,000 colored: Total deaths from all causes in August, 2,113—44 colored. Annual death rate: white, 14.91; colored, 27.26; 15.09; deaths from diphtheria, 60; typhoid fever, 62; scarlet fever, 28; measles, 13; whooping-cough, 14; consumption, 188; deaths under 5, 907.

Typhoid fever.—Fortunately for the health of the people of Chicago ("Inter-Ocean," Oct. 1), the opening of the drainage canal, Dec. 1, promises a relief to the present deadly situation. With the principal usefulness of the Bridgeport plant, about to be terminated in two or three months, it seems as if it could now be run full capacity, even at the risk of being worn out fast. Typhoid fever is now causing twenty-nine or thirty deaths out of every 1,000, and the rate is mounting higher daily with the present dangerous condition of the water supply. Every rainstorm or strong northwest wind throws great quantities of filth out around the cribs, and deaths by the score result. Yet the city authorities apparently do not give a thought toward a remedy.

Horses Get Pink Eye.—Thousands of horses throughout the city ("Inter-Ocean," Sept. 28) have been attacked with pink eye.

This is especially so in the West division, where there is hardly a stable of any size that does not have in it from one to a score of these equine patients. This is an unusual case, but it shows with what rapidity the disease has spread and its great diffusion among the horses of this city.

INDIANA.—Reports to the Secretary of the State Board of Health show an increase in September and prevalence of the following diseases: Intermittent fever, rheumatism, tonsilitis, bronchitis, diphtheria, scarlet fever, pleuritis, pneumonia, typhoid fever and whooping-cough. The diseases decreasing were: Dysentery, cholera morbus, cholera infantum, inflammation of bowels, erysipelas, cerebro-spinal meningitis, measles and puerperal fever.

School Sanitation.—Judge Taylor, Circuit Judge of Tippecanoe County, issued a restraining order, Oct. 4, against the township trustees of Clark's Hill, Tippecanoe County, to prevent the use of a condemned building for school purposes and declaring it a nuisance. The building was condemned by the county health authorities. The victory is an important one for the State Board of Health, as it is the first case it has won in its fight for sanitary school buildings.

KANSAS.—Topeka (Capital), Oct. 10.—*Cuban Chicken-Pox* is epidemic in Topeka. The City Board of Health, at its meeting yesterday, decided to ask the council to appoint a health officer for each ward of the city, whose business it will be to look after the sanitary condition of his ward. City Physician Peers says:

"Some weeks ago, when Clarence Scott, the North Topeka man, became afflicted with what was at first supposed to be smallpox, I prophesied that Topeka would have an epidemic of chicken-pox. The epidemic is upon us. The people of the city should know just the condition of affairs and assist us in getting the city into good shape to resist the disease."

LOUISIANA.—New Orleans, 300,000—90,000 colored—August, '99: Total deaths, 532—197 colored; death rates, white, 19.19; colored, 32.52: 25.85. Deaths from phthisis, 59—31 colored; typho-malarial fever, 8; typhoid fever, 15. For September: Total deaths, 510—197 colored; death rates, white, 17.89; colored, 26.26: 20.07. Deaths from phthisis, 81; typho-malarial fever, 9; typhoid fever, 18; yellow fever, 6.

Oct. 12.—Cases of yellow fever reported to date, 43, with 12 deaths. Dr. Carter, of the Marine Hospital Service, is actively co-operating with the health authorities. Every case is promptly dealt with as soon as reported. Segregation of cases and thorough disinfection of premises and fomites scrupulously practiced. By these means an epidemic has been prevented.

MASSACHUSETTS.—Boston, 541,827, August, '99: Total deaths, 957; death rate, 21.19; from diphtheria and croup, 20; typhoid fever, 19; cerebro-spinal fever, 3; cholera infantum, 91; phthisis, 89; deaths of children under 5, 100.

Twenty-Seventh Annual Report, for the Year 1898.—The total number of deaths for the year was 10,886, a decrease from the previous year of 268 deaths. The population, as estimated at the end of the year, is 541,827. Death rate, 20.09—less by .99 than that of the previous year, and the lowest on record. There were 1,470 deaths from zymotic diseases—336 less than from the same group of the previous year. There were 241 less deaths from diphtheria than in 1897, with a proportionate decrease in the number of cases. The percentage of deaths to the number of cases of diphtheria reported was 10.23, as against 12.09 per cent. the preceding year. There were 33 deaths from scarlatina, 103 less deaths than in the preceding year and 129 less than the average of the five previous years. Typhoid fever caused 185 deaths during the year. Ninety of the deaths from this cause occurred during the months of August, September and October and 113 of the whole number died between the ages of 20 and 40 years. There were 27 deaths from measles during the year. The number of deaths of children under 5 years of age was 3,577 compared with 3,708 for the previous year, showing a decrease of 131 deaths. The respiratory cases are still the most fatal, causing fully 25 per cent. of the whole mortality the past year, as against 26 per cent. in 1897.

The most important works of the year were the destruction of old tenement houses, paving and draining alleyways, establishing a bacteriological laboratory, securing an improved milk supply and extending the measures for protecting the health of the schools.

Diphtheria is prevalent in Cambridge, Brookline and Springfield. *Typhoid fever* is prevalent in Bristol. Five cases of *small-pox* were discovered in Chelsea, Sept. 26.

MICHIGAN.—The Secretary of the State Board of Health re-

ports for September: Consumption was reported present at 205 places; typhoid fever at 179 places; scarlet fever at 86 places; diphtheria at 41 places; whooping-cough at 26 places; measles at 20 places; cerebro-spinal meningitis at 8 places and smallpox at 2 places. Compared with the average for September in the 13 years, 1886-98, diphtheria, erysipelas, remittent fever, intermittent fever, whooping cough, consumption, typhoid fever, pneumonia and influenza were less prevalent.

Deaths reported to the Secretary of State during the month of September, 2,733, 12 less than for the preceding month and 115 more than for September, 1898. Death rate for the month was 14.0. Deaths of infants under 1 year, 683; 1 to 4, 248. From phthisis, 135; other forms of tuberculosis, 55; typhoid fever, 72; diphtheria and croup, 32; scarlet fever, 8; measles, 3; whooping cough, 19; pneumonia, 87; diarrhœal diseases of children, 522; cerebro-spinal meningitis, 47; cancer, 116; accidents and violence, 188.

The new law providing for the licensing of barbers in all towns in Michigan of over 10,000 inhabitants has gone into effect. All barbers now in the business are entitled to a license upon making application to the commission and paying a fee of $1. Hereafter, however, all persons who desire to engage in the business must pass a satisfactory examination before the State Commission as to their proficiency in the use of the razor, as well as of disinfecting tools, so as to prevent the spreading of disease.

The Michigan Legislature has recently passed a law forbidding the marriage of any person suffering from infectious or transmissible diseases. The law states that any one so diseased who may marry shall be guilty of felony punishable by a fine of not less than $500 or more than $1,000, or imprisonment for a term not exceeding five years, or by both fine and imprisonment.

MINNESOTA.—Minneapolis, 225,602; Aug., '99: Total deaths, 198; death rate, 10.93; from zymotic diseases, 45; phthisis, 21; deaths under 5 years, 100.

St. Paul, 200,000; Aug., '99: Total deaths, 102; death rate, 6.11; from infectious diseases, 25; phthisis, 14; deaths under 5, 32.

Annual report for 1898: Deaths, 1,737; under 5 years of age, 632; death rate, 8.13. The more prominent causes of death and the number therefrom were: Tuberculosis, 234; pneumonia, 238; heart disease, 141; meningitis, 100; cancer, 74; diphtheria, 65;

inanition, 61; convulsions, 60; marasmus, 49; Bright's disease, 47; typhoid fever, 43.

MISSISSIPPI.—Yellow fever has continued to crop out since our October report, as follows: Mississippi City, Sept. 14 to 29, 26 cases, with one death; Jackson, Sept. 10 to Oct. 2, 12 cases, with four deaths; Centerville, Sept. 29, 2 cases. Officers of the Marine Hospital Service are in active co-operation with the State health authorities and, as in New Orleans, the disease has been so promptly and so effectually dealt with as to do away with any obstruction to commerce by needless quarantine restrictions.

MISSOURI.—St. Louis, 623,000; Aug., '99: Total deaths, 794; death rate, 15.28; from zymotic diseases, 153; phthisis, 93; deaths under 5 years, 256.

Kansas City, 200,000; Aug., '99: Total deaths, 197; under 5 years 56; death rate, 11.82; deaths from tuberculosis, 13; typhoid fever, 10.

St. Joseph ("News"), Sept. 26: Diphtheria is epidemic. City Physician Graham does not hesitate to say that the public schools are the greatest source of infection that the health authorities have to contend with. Filthy surroundings have more to do with a spread of the disease than anything else. There is one precaution that every family should take, the city physician says, and that is to keep back yards clean. Filthy garbage receptacles and bad sewers breed diphtheria germs and the children are stricken. People cannot be too careful in this respect.

NEW JERSEY.—Newark, 240,000; 4 weeks, Sept. 30, '99: Total deaths, 285; death rate, 15.43; from typhoid fever, 4; phthisis, 34; deaths under 5 years, 112.

Paterson, 115,944; Aug., '99: Total deaths, 171; under 5 years, 35; death rate, 14.51; from zymotic diseases, 56; typhoid fever, 2; phthisis, 13.

NORTH CAROLINA.—Twenty-one towns, population 152,853—63,275 colored, report for Aug., '99, 209 deaths, 93 colored; death rates, white, 15.5; colored, 17.6: 16.4; deaths from consumption, 17; diarrhœal diseases, 30; malarial fever, 7; typhoid fever, 22; deaths under 5 years of age, 79.

OHIO.—The Secretary's bulletin reports cases of and deaths from infectious diseases in 52 localities with an aggregate population of 1,357,387, for five weeks, ending Sept. 2, as follows:

Diphtheria, 76 cases, 16 deaths; scarlatina, 183 cases, 4 deaths; typhoid fever, 198 cases, 41 deaths; whooping cough, 69 cases, 7 deaths; measles, 22 cases.

Smallpox: Since report in July-Aug. bulletin—Cincinnati, 11 cases; Cleveland, 5 cases; Columbus, 17 cases; Lancaster, 13 cases, 1 death; Mad River Tp., 1 case; Margarette Tp., 1 case; Proctorville, 18 cases; Sandusky, 8 cases. 74 cases, 1 death.

This makes a total since the first outbreak—April 6, 1898, to September 21, 1899—of 2,096 cases and 31 deaths. Since January 1, 1899, 1,427 cases and 26 deaths have been reported.

Cincinnati, 405,000: Deaths reported for Aug., '99, 398; under five years of age, 116; death rate, 11.79; deaths from zymotic diseases, 71; typhoid fever, 11; phthisis, 40.

Cleveland, 395,000, Aug., '99: Total deaths, 457; deaths under five years, 201; death rate, 13.88; from zymotic diseases, 19—typhoid fever, 10; phthisis (21; tuberculosis, 22): 43.

Ashtabula, ("Beacon"), Sept. 20: *Typhoid fever* in this city has begun to assume alarming proportions.

Urbana ("Times-Citizen"), Sept. 30: An epidemic of typhoid fever is raging at present in the village of Tremont. Dr. Hiroms, the village physician, reports seventeen cases. It is thought that the epidemic is due to the low water in the drinking wells.

Pennsylvania.—Philadelphia, 1,266,832, 5 weeks, Sept. 30, '99: Total deaths, 1,640; under 5 years, 670; death rate, 13.46; deaths from typhoid fever, 38; diphtheria, 76; phthisis, 241.

Pittsburg, 305,000, 5 weeks, Sept. 30, '99: Total deaths, 522; under 5 years, 213; death rate, 17.6; from typhoid fever, 43; diphtheria, 11; phthisis, 42.

Lancaster is reported (Phil. "No. American"), Sept. 22, to have an epidemic of diphtheria; Glenfield also (Pittsburg "Chronicle"), Oct. 10.

Typhoid fever is reported prevalent in Williamsport and Laughlingtown.

Rhode Island.—Newport ("Herald"), Oct. 11: Typhoid fever has developed among the apprentices at the Naval Station.

After visiting the patients at the hospital, Medical Inspector Siegfried ordered the supply of city water shut off from the station. and water from the reservoir on Coasters Harbor Island is now being used. The city council committee on health and sanitation held a meeting to hear the report of a sub-committee ap-

pointed to consult with Dr. P. F. Curley regarding the prevalence of typhoid fever. The sub-committee reported that Dr. Curley had said there was no epidemic of typhoid fever in the city, and that the number of cases is no greater than at this season in other years, but that the number of prominent cases had made it appear to be a more general spread of the disease.

SOUTH CAROLINA.—Charleston, 65,165—36,295 colored, 4 weeks, Oct. 7, '99: Total deaths, 117—102 colored; under 5 years, 41; death rates, white, 9.45; colored, 32.96; 23.43; deaths from phthisis, 11—all colored.

TEXAS.—The State health officer appears to have been particularly active during the past month in his effort to maintain an obstructive quarantine against persons and merchandise from New Orleans, notwithstanding the daily assurances that a rigid quarantine of departure is maintained in that city against all persons and things that have been exposed to yellow fever; insomuch that the Governor of Louisiana has notified ("Times-Democrat," Oct. 9) the Governor of Texas that he "would," at an early date, "apply to the Supreme Court of the United States for a perliminary injunction to restrain the State of Texas, Joseph Sayres, her Governor, and her health officer, William F. Blunt, from establishing and maintaining an embargo on interstate commerce between the State of Louisiana and the State of Texas, operated under the guise of quarantine."

UTAH.—Salt Lake City, 70,000; report for August, '99: Total deaths, 60; under 5 years of age, 25; death rate, 10.28; deaths from zymotic diseases, 17—13 from cholera infantum; septicæmia, typhoid fever, whooping cough and puerperal fever, each 1.

WASHINGTON.—Seattle, 75,000, Aug., '99: Total deaths, 44; 9 under 5 years; death rate, 7.04; deaths from phthisis, 2; typhoid fever, 3; diphtheria, 2.

WISCONSIN.—The Wisconsin State Board of Health has taken up the question of sanitation of passenger cars, and it has been decided to appoint a committee to confer with the railroad companies in the State, and ask them to improve the sanitary conditions of their passenger cars in the following respects: First, to provide cuspidors containing disinfectants for all smoking cars

and smoking rooms in sleeping cars; second, to give more attention to disinfecting passenger coaches at the end of each run; third, that better arrangements be made for the ventilation of passenger day coaches and sleeping cars.

Milwaukee, 285,000, Aug., '99: Total deaths, 338—177 under 5 years; death rate, 14.23; from typhoid fever, 4; diphtheria, 4; phthisis, 26; other tubercular diseases, 5.

Report for the year 1898: Births, 7,796—154 more than in previous year; deaths, 3,338; death rate, 11.92. Deaths of children under 5 years of age, 1,346—756 less than in previous year. The gain in this respect is attributed to a purer milk supply. The deaths from diphtheria have steadily decreased since the use of antitoxin has become general.

In 1892 there were 1,193 cases, with 400 deaths, or 33.5 per cent.; in 1893 there were 620 cases, with 209 deaths, or 33.7 per cent.; in 1894 there were 436 cases and 165 deaths, or 37.8 per cent.; in 1895 there were 375 cases and 112 deaths, or 30 per cent.; in 1896 there were 919 cases, with 198 deaths, or 21.5 per cent., and in 1897 there were 708 cases, with 138 deaths, or 19.6 per cent.

Of typhoid fever there were 132 cases, including 12 in returning soldiers, with 46 deaths, a fatality that suggests that only about one-third of the cases in the city were reported.

Pulmonary tuberculosis, 316 deaths; from other tubercular diseases, 114: 430—12.28 per cent. of total mortality.

CUBA.—Havana's sanitary condition (New York "Times," Oct. 18).

To the Editor of the New York Times:

My attention has been called to a long communication in your issue of Oct. 2, entitled "The Key West Fever Fight," and signed "M. H. S.," presumably a representative of the Marine Hospital Service.

The paragraph at the top of the right-hand column conveys incorrect information as to the yellow fever data in Havana, which it seems worth while to correct, particularly as the purport of it is directly contradicted by statements made both in the official reports of the Department of Havana, recently issued, and in the public health reports, made by the Marine Hospital Service. I therefore inclose you the statistics for August and September on the accom-

panying sheets, carefully prepared from all the information available in the City of Havana, public and private.

For August the yellow fever cases were 34 and the deaths 11, contrasted with the record for the previous August, which was a minimum year, of 22 deaths. For the month of September the total number of cases was 54 and the deaths 18, the lowest previous record for September, namely, 1898, being 37 deaths.

As to what has been the result of the sanitation to which Havana has been subjected, which the writer of the article in question seeks to disparage, I cannot do better than refer to the official report of Dr. Rosenau, the representative in Havana of the Marine Hospital Service, who, under date of Sept. 17, states that "in Havana the usual order of things has been reversed; Havana has quarantined against Key West—that is, the same precautions are now being taken against Key West that Key West was wont to take against Havana."

Further on in an italicized sentence, Dr. Rosenau states: "With the single exception of the outbreak among the soldiers at Cabaña, there has not been a single instance of a second case of yellow fever occurring in a house disinfected by the Sanitary Department of this city," and he adds the phrase, "A very enviable record."

The authorities in Havana are quite content to let the facts in these cases speak for themselves, but demur to their being misrepresented.

The case of the soldiers at Cabaña was peculiar, the command consisting of over 600 men, who lived in the fortress for three and one-half months before any case of fever occurred, when several cases in succession were imported from the outside, and thereafter several cases occurred, which could not be accounted for in this way. Another marked feature of the case was the fact that over sixty military prisoners who were continuously in the fortress and occupied in the doing of the dirty work of the garrison, removing garbage, etc., who were known not to have left the fortress, did not have a single case of fever among them. Either, then, the imported cases produced a temporary or local infection or else some unknown and secret portion of the fortress had been explored by some of the garrison, which had not been opened up and disinfected by the disinfecting force. However this may be, the removal of the garrison to camp and the redisinfection of the fortress has effected the complete disappearance of the fever.

This communication is made less for the purpose of correcting errors than to avoid the disparagement of sanitary work, which

is imputed in the communication in the New York "Times," as there is reason to believe from our experience in Havana that sanitation alone, if absolutely thorough, can be relied upon to reduce enormously the mortality from epidemic yellow fever, and this is too valuable a result to be lost sight of in the general economy of tropical and semi-tropical cities.

While on the subject, may I correct an important error occurring on page 1,634 of the Marine Hospital Public Health Report of Sept. 29, where Havana is charged during the three months from June 15 to Sept. 14 with 114 cases of fever and 34 deaths, the actual figures being: Cases, 72; deaths, 29?

JOHN G. DAVIS,
Major and Surgeon United States Volunteers,
Havana, Oct. 11, 1899. Chief Sanitary Officer.

HAVANA, Oct. 17.—Mrs. Letorde, wife of Military Governor Ludlow's acting chief clerk, died to-day from yellow fever. She was the first American woman since the occupation to contract the disease.

Almost every case of the fever among the Americans is traceable to certain places frequented by them. There have been twenty cases of the fever this month and seven deaths.

Major Davis, Chief Sanitary Officer, says he is in favor of not allowing Americans to land in Havana next year between July and October.

CITY OF MEXICO, 344,377: Deaths for July, 1,387—616 under 5 years of age; death rate, 46.32. Deaths from tuberculosis, 129; pneumonia, 80; typhus fever, 23; smallpox, 24; diarrhœa and enteritis, 312; gastro-enteritis, 124; infantile diarrhœa, 20.

BATHS IN PUBLIC SCHOOLHOUSES.—The initiative in this much desired object is reported to have been recently taken in Boston. The Paul Revere school building in that city has had its basement fitted up with bathing facilities for the use of the attending children. There are two entirely separate apartments, one for boys and the other one for the girl pupils. Thirty children can bathe in each section at one time, a towel and piece of soap being furnished to each bather. The janitor looks after the boys and a matron has charge of the girls, and practical instruction is given on bathing and the art of cleanliness in each case. These baths are an experiment so far, but if they succeed the same facilities will be furnished to the other schools.

BOOK REVIEWS.

INDEX CATALOGUE OF THE LIBRARY OF THE SURGEON-GENERAL'S OFFICE, U. S. ARMY. Second Series, vols. iii. and iv. C—CZYGAN, D—EMULSIONS. Prepared by JAMES C. MERRILL, Major and Surgeon, U. S. Army, Librarian of the Surgeon-General's Office, under the direction of the Surgeon-General, U. S. Army. 4to pp. 1,100—917. Washington: Government Printing Office, 1899.

These volumes comprehend the catalogue of every publication of value contributory to the medical sciences that has been published during recent years, beginning with the initial letters specified, and are gotten up in the same excellent style common to the work since its beginning.

In vol. iii. the catalogue of publications on cancer occupies twenty-nine pages; cholera, one hundred pages. In vol. iv. the enumeration on diphtheria fills seventy-seven pages; disinfection, seventeen; the ear and its diseases, seventy-seven; education (hygiene in and medical), sixty pages, remarkably illustrating the interest taken in these subjects respectively during recent years.

THE MINERAL WATERS OF THE UNITED STATES AND THEIR THERAPEUTIC USES.—With an account of the various mineral spring localities, their advantages as health resorts, means of access, etc., to which is added an appendix on POTABLE WATERS. By JAMES K. CROOK, A.M., M.D., Adjunct Professor of Clinical Medicine and Physical Diagnosis in the New York Post Graduate Medical School; Attending Physician to the Post Graduate Hospital; Member of the Medical Societies of the County and of the State of New York; Fellow of the New York Academy of Medicine, etc. 8vo, pp. 580. Cloth. $3.50 net. Lee Brothers & Co., New York and Philadelphia.

This book purports to be "a complete and discriminating work on the mineral waters of the United States," comprehending the gist of all previous publications on the subject and adding their therapeutic uses. The scope is a large one and the author has freely availed himself of previous publications, too much, indeed, in some respects, notably in the most important respect—that of therapeutics; too much of the common *literature* of the springs

and too little deduced from the chemistry of the waters. Nevertheless it is a work of much practical utility to medical practitioners, because it presents the chemistry of the waters more in detail than any previous publication, by which their therapeutical properties can be better apprehended than by their commonly alleged effects wholly inconsistent with their chemical constituents. The appendix on "Potable Waters," with which all physicians should be familiar, materially adds to its value.

REPORT ON THE INVESTIGATIONS INTO THE PURIFICATION OF THE OHIO RIVER WATER FOR THE IMPROVED WATER SUPPLY OF THE CITY OF CINCINNATI, O.—Made by the Board of Trustees, Commissioners of Water Works, Cincinnati.

A volume of six hundred and thirty pages, with charts and many statistical tables, giving the results of an exhaustive study of one of the most important river water supplies in the country. "The results obtained by different methods of treatment of the Ohio River water under varying conditions are given with great detail," together with the conclusions arrived at by Mr. Geo. W. Fuller, Chief Chemist and Bacteriologist, after a critical analysis of the results. Besides the special object of the investigations as stated in the title of this report, the investigations are of great practical utility to all hydraulic engineers, bacteriologists and others interested in pure water supplies.

MEDICAL DIRECTORY OF NEW YORK, NEW JERSEY AND CONNECTICUT, 1899. 12mo, pp. 881. E. Elliot Harris, M.D., Editor, 33 W. 93d st., New York.

This is vol. I of a *new* medical directory, published under the auspices of the New York State Medical Association. It comprehends 11,625 registered names of physicians: 9,199 in the State of New York; 1,481 in New Jersey, and 945 in Connecticut. Of the 9,199 in New York 3,324 are credited to Manhattan and the Bronx, 1,146 to Brooklyn, 91 to Queens and 54 to Richmond: 4,615 in Greater New York. Dentists, 2,798: 2,082 in New York, 364 in New Jersey, 352 in Connecticut. The boroughs of Manhattan and Bronx are credited with 741, Brooklyn 290. Pharmacists, 4,738: 3,680 in New York, 755 in New Jersey and 283 in Connecticut. The boroughs of Manhattan and Bronx show 929, Brooklyn 503. Total number of names in the directory, 19,161.

Its usefulness is greatly increased as a book of reference by

alphabetical lists of the physicians in the several States, of the by-laws of the medical associations and societies, of the laws relating to the practice of medicine, dentistry and pharmacy, including the new law, known as the Dispensary Bill.

Copies may be obtained of Dr. O. C. Ludlow, 2309 7th ave., New York City, by enclosing to him a money order for $2 for each copy.

AN INTERVIEW.—An ornate brochure on LISTERINE, tersely describing its properties as the most agreeable and excellent deodorant and antiseptic and its adaptedness to the use of physicians, dentists and nurses and to the toilet. Lambert Pharmacal Co., St. Louis, Mo.

CONTEMPORARY LITERATURE.

SOCIAL TENDENCIES.

In the October number of the "North American Review" the Rt. Rev. H. C. Potter, Bishop of New York, reviews certain "Social Tendencies in America" which, in his judgment, unless they be corrected, portend social disaster to our people. He finds a startling parallel between the mischievous and alarming elements which are at work among the French and those which are at present observable among the people of the United States. He lays particular stress upon the views and practices which, through disregarding the sanctity and indissolubility of marriage, threaten the sacred institution of the family:

"But, to advance a step higher, what shall we say of those social relations which, as compared with those of business and the State, are so much closer and more intimate? There is one of these which, in one sense, stands at the centre of our whole social system, and which has, in the progress of human society out of the brutalities of its lower barbarisms, been its distinguishing note. I mean the institution of marriage. Some recent features of our social history may well awaken in even the most unreflecting among us, in this connection, profound anxiety; and, if they do not, sooner or later, bring to pass throughout the land some strenuous movement of legal and moral reform, are surely prophetic of the most deplorable consequences."

"The Help That Harms" is also the subject of an article by the Bishop in the October number of "Appletons' Popular Science Monthly," nobly seconding the efforts of Comptroller Coler to properly discriminate the administration of charities and business enterprises, destitution and dependence.

"Our modern social order," he remarks, "has become more complex, more segregated, more specialized. A whole class of people in cities—those I mean of considerable wealth—with a few noble exceptions (which, however, in our greater cities, thank God, are becoming daily less rare), live in profound ignorance of the condition of their fellow citizens. Now and then, in some sharp reverse of the financial world or some national recurrence of 'bad times,' they are made aware that large numbers of their neighbors are out of work and starving. And, at all times, they are no less reminded that there is a considerable class—how appallingly large it is growing in New York Mr. Coler has told us—who need help, or think they do, and who, at any rate, more or less noisily demand it in the street, at the door, by begging letter or in a dozen other ways that make the rich man understand why the prayer of Agur was (Proverbs xxx., 8): 'Give me neither poverty nor riches.'"

THE BIBLE.

The publication of that new and magnificent product of modern technical art, "The Polychrome Bible," has been made the occasion in the October "Monist" for a unique and representative discussion of the world's greatest book. Dr. C. H. Cornill, Professor of Old Testament theology in the University of Breslau, and one of the foremost of German Biblical critics, has treated the Bible from the point of view of the higher criticism, as it is accepted in scientific theological circles in Germany; Dr. W. Henry Green, of Princeton, the Nestor of American Biblical critics, has subjected the arguments of Dr. Cornill to some mild animadversions from the standpoint of the old orthodox and Calvinistic view of the Bible; and, finally, Dr. Paul Carus, the editor of "The Monist," has developed the ethical implications of the Bible question in its entirety from the absolutely independent point of view of secular scientific criticism and of common sense.—Open Court Publishing Company, Chicago.

FRIENDSHIP THE UNDYING BOND.

In "Love Across the Lines," by Harry Stillwell Edwards, the

complete novel in the "New Lippincott" for October, the value of friendship is thus given:

"I believe that friendship is the one undying bond of our race. All others have their limitations—even love of man and woman burns itself out. I believe that somewhere between men such a friendship as this exists; to love where another loves instantly and forever; to hate where he hates blindly and implacably; to hold his honor higher and sweeter than life, his happiness above one's own; to feel this holy affection so strong that it permeates every quality of mind and body and makes us in truth that which we believe our friend to be. In such a friendship self perishes. We look into the eyes of our friend and say: 'Command!' We do not question; we trust implicitly, blindly; and if we err——' "

WHISKY AND COFFINS.

Capt. Slocum, who is telling in the October "Century" of his voyage around the world alone in a little sloop, the Spray, was familiar with most of the ports in which he found himself on his journey of 46,000 miles. One of these was Buenos Ayres. There he looked in vain for the man who once sold whisky and coffins in Buenos Ayres; the march of civilization had crushed him—memory only clung to his name. "Enterprising man that he was, I fain would have looked him up. I remember the tiers of whisky barrels, ranged on end, on one side of the store, while on the other side, and divided by a thin partition, were the coffins in the same order, of all sizes and in great numbers. The unique arrangement seemed in oder, for as a cask was emptied a coffin might be filled. Besides cheap whisky and many other liquors, he sold "cider," which he manufactured from damaged Malaga raisins. Within the scope of his enterprise was also the sale of mineral waters, not entirely blameless of the germs of disease. This man surely catered to all the tastes, wants and conditions of his customers."

The *Review of Reviews* for October accords to "Dewey Day" its appropriate recognition, publishing an illustrated description of the artistic decorations in New York from the pen of Ernest Knaufft, the well-known writer on art subjects. It contains the first complete account of the remarkable Hearst architectural competition for the University of California, which came to an end September 7, with the award of a first prize of $10,000 to the eminent French architect, E. Bénard, and of four other prizes amounting to an equal sum to American competitors. The article in the

"Review," which was written by Mr. H. S. Allen, of San Francisco, is illustrated with perspective views of the prize plans, a portrait of Mrs. Phebe Hearst, whose munificence made the competition possible, and portraits of the distinguished architects who served on the jury of award. There is a brief article on the National Export Exposition, now in progress in Philadelphia, and Mr. Corry M. Stadden reviews our diplomatic relations with Nicaragua, with reference to the prospective canal and other commercial developments. The work of our army supply departments in the Philippines, which has been to a great extent ignored in newspaper discussion of the situation at Manila, is described by Chief Quartermaster James W. Pope.

G. W. Steevens, the war correspondent who became famous for his dramatic narrative of Kitchener's campaign to Khartoum, shows, in a thoughtful article in the October number of *Harper's Magazine,* the debasing effect of the Dreyfus affair on France. An article by Hon. John Barrett, late United States Minister to Siam, and for ten months war correspondent at Manila, gives an admirable representation of the character and personality of Admiral Dewey. Sir Martin Conway, the greatest mountain climber in the world, opens the number with the story of his ascent of Illimani, one of the highest and most inaccessible peaks of the Bolivian Andes. Part second of "The First American: His Homes and His Households," by Leila Herbert, gives an interesting description of Washington's life in New York when that city was the seat of the National Government. Julian Ralph, under the title "Tenting on Two Seas," describes a voyage on one of the famous P. and O. steamers from England to Calcutta. Short stories are contributed by Seumas MacManus, I. Zangwill, Mary Hartwell Catherwood and Stephen Crane.

The largest issue of *Harper's Weekly* ever published is the Dewey memorial number, ready Sept. 28. Between its ornamental covers, printed in colors, are fifty-six pages, devoted almost entirely to Admiral George Dewey and the eventful incidents in his career. For interesting and authoritative articles and fine drawings this Dewey number is perhaps unprecedented in the annals of illustrated periodicals. Rudyard Kipling contributes a poem, his most striking work since his illness, appropriately entitled "Let Us Now Praise Famous Men." A history of the Dewey family and a sketch of the Admiral's life is contributed by the Hon. John Barrett, late United States Minister to Siam, an in-

timate friend of the Admiral, and closely associated with him for ten months at Manila. Throughout this period Mr. Barrett kept careful notes of everything of material interest, and consequently his article contains a mass of entirely new information upon these all-engrossing subjects. The number contains also an important article on the United States Navy, by Henry Loomis Nelson, and special articles on Dewey and the Manila campaign, illustrated with many hitherto unpublished portraits and with superb drawings of naval scenes. It is a number that is not only worth reading but worth preserving. The isssue for Oct. 7 will describe Admiral Dewey's reception in New York, and the succeeding number will be given over to the story of the contest for the America's Cup.

The special fashion number of *Harper's Bazar,* published Oct. 7, contains a comprehensive and authoritative presentation of autumn and winter fashions. The number is elaborately illustrated and gives full descriptions of the reception gowns, outing costumes, capes, wraps, house gowns and negligee costumes which will be worn during the coming autumn and winter. The large number of new and original fashion hints make this issue invaluable to every woman.

The October number of *St. Nicholas* marks the end of the magazine's six-and-twentieth year and brings to a close several serials that have been running for six months or more. "Trinity Bells," by Amelia E. Barr, is one of these; others are Carolyn Wells' "Story of Betty" and Rupert Hughes' "Dozen from Lakerim." These are works of fiction; but besides these there are in this number several short stories, in which fact and fiction are mysteriously mingled, and others that are founded upon fact and built up of the same material. Such is "The Walking Purchase," which tells the truth about a deal with the Indians that did no credit to the name of Penn, by whose sons it was carried out in a way to swindle the Delawares of two hundred thousand acres of good land; and such the sketch of "Searchlights," a mascot at Manila. "The Southern Cross" is described and diagrammed by Miss Mary Proctor, daughter of the popular astronomer. An October magazine without an article on Admiral Dewey would seem anomalous, and "St. Nicholas" pays due tribute to the hero of Manila through the pen of Tudor Jenks. A portrait accompanies this paper; and almost every article, story and poem in the number is fully illustrated, among the illustrators being Reginald Birch, Charles M. Relyea, O. Herford and Fanny Y. Cory.

THE SANITARIAN.

DECEMBER, 1899.

NUMBER 361.

THE NEXT STEP IN THE WORK OF REFUSE AND GARBAGE DISPOSAL.*

By W. F. MORSE, Sanitary Engineer, New York City.

The Report of the Committee on Garbage Disposal at the last meeting of this Association contained conclusions formulated after an exhaustive survey of the present conditions here and abroad. Unfortunately, it did not contain tabulated information in detail, now supplied, which would have added much to its value. The conclusions reached may be briefly stated as a basis for comparison in estimating the progress made in the year past, and are substantially as follows:

1. The reduction methods for garbage disposal are applicable only to large cities. It has been found impracticable to conduct the works so that a nuisance would be wholly prevented unless located at points where an occasional malodor would not be considered a nuisance. A number of works have been abandoned for sanitary or financial reasons. In many cases the reduction process does not dispose of all the offensive material, and therefore should be operated in conjunction with cremation.
2. When separation of the various waste materials cannot be made, there is but one way to satisfactorily accomplish final disposal—by cremation.
3. That garbage and other refuse, and ashes, can be burned without additional fuel if means be taken to remove the fine ash.
4. That the garbage in American cities contains more liquids in suspension than in Europe, but an additional amount of combustible material compensates for the moisture.

* Read at meeting of the American Public Health Association, Minneapolis, Nov. 3, 1899. Reprinted from the Transactions.

5. In view of the results, as obtained in England and Germany, there appears to be no reason why the same methods of disposal, under the same limitations and conditions, should not be equally successful in this country.

The lapse of a year since the report referred to was made has brought out some interesting facts, adding to our knowledge in several important particulars, that promise to be of service in the future.

The methods of reduction, or the conversion of garbage by mechanical or chemical process into commercial products, have not much changed.

The city of Boston brought into use a large and elaborately equipped plant for the daily conversion of 200 tons of separated garbage. The plant is operated by the same company that controls the work in Philadelphia and New York, and the garbage is taken from the city dumps in the scows of the company to the works, six miles down the harbor. The introduction of an improved system of presses provides for the continuous crushing of the garbage to extract the water and grease, under conditions which do not allow the escape of offensive odors. A further provision has been made for a system of conveyers and transfers which receive and dispose of the garbage without loss of time, and in a manner which prevents the escape of offensive fumes. This Boston plant is understood to be an improvement on any heretofore erected by this company or others. It may be considered a model equipment in every respect.

When a sufficient amount of garbage, say from a population of 150,000 people or upwards, can be satisfactorily separated from other substances and, by the best improved agencies, be so treated, mechanically and chemically, as to be without offensive odors in the process, and when the works can be so situated that an expensive haul is not necessary, evidently reduction has a peculiar value, not only for its own purposes of obtaining grease and fertilizing material, but also because that it is practically impossible to destroy separated garbage by cremation, brought to the works in large amounts, unless a considerable quantity of fuel is employed.

We know from experience that ten tons of garbage can be destroyed by a ton of coal, and if, to the cost of the coal, is added the cost of the labor, in localities where fuels are expensive, crema-

tion becomes burdensome. The question was put a short time ago to an English engineer whose experience has been great in the matter of burning municipal waste abroad, whether he could destroy the 350 or 400 tons of selected garbage then lying before him in a scow without the employment of coal or other fuel, and he unhesitatingly said that it could not be done. We must concede that under certain conditions the utilization process has not only a claim, but, so to speak, the right of way, as against other methods for the disposal of waste, and that, independent of the value to be derived from its mechanical treatment, some consideration should be paid to the argument that it is not only wise, but emphatically a duty, to restore to the ground in some form of fertilization the constituent parts of vegetable foods which have been taken from it.

* * * * * * *

On the other hand, the progress of cremation methods within the year has been steady, though slow. Several crematory furnaces have been built or are now being completed, and others are under contract.

There are now over one hundred cities and towns in the United States investigating, advertising, seeking information, and awaiting the advent of a thoroughly satisfactory and efficient apparatus or methods for the disposal of their waste. But it is a significant fact that in the year past none of the large cities has signed contracts for disposal, though many opportunities have been offered.

Chicago, Milwaukee, Louisville, Savannah, Atlanta, Albany, Binghamton, Manchester and many other places, have asked for proposals—in some instances two or three times over—and received tenders for crematory furnaces, and from companies specially organized to take up the work in various ways, but in each case the cities have declined to make awards. There appears to be an unwillingness to accept the plans offered, and a distrust of the appliances or measures proposed, as being unsuitable for one or another reason.

The chief points in which improvements of the present methods are to be made are:

a. The certainty of disposing of waste without creating a nuisance in the operation.
b. The reduction of the cost of cremating by employing the waste itself as fuel.

c. The separation, at small expense, of articles and substances found in municipal waste that have value and are marketable.
d. The utilization of the surplus heat from burning waste for useful purposes.

a. *Primarily, the removal and destruction* of useless and offensive matter from the community for the public protection and public comfort is the pupose and end of all our efforts. No consideration must be allowed to supersede or interfere with the sanitary side of this question; therefore, no reduction process or crematory furnace can ever be successful that does not give immunity from nuisance in performing its work. That it is entirely possible to destroy waste by fire, with no objectionable results, has been repeatedly proven by many examples; and it may be assumed at once that, with the use of the best methods and apparatus, and continued attention, everything worthless, dangerous and offensive produced by a town or city can be burned without creating nuisance. With this principle clearly defined and accomplished, all else is possible; without it nothing in this work can be of permanent value or service.

b. *Nearly every one of the cremating furnaces now in use* destroys the garbage by main force, so to speak. They proceed by separating the putrescible matters—placing this in large quantities in a furnace and using fuel to consume it. But little attempt is made to utilize the combustible rubbish; this, as a rule, goes with the ashes to the dumps, and there creates trouble and annoyance.

Thus the cost of fuel becomes an important factor, and has often decided the question against cremation in localities where fuels are expensive. There has been a considerable decrease in operating expenses since the beginning of this work ten years ago, but this item can be brought still lower, or eliminated altogether, by bringing into use apparatus and means which latest experiments have shown to be successful.

It should be remembered that every ton of average separated garbage contains from 1,400 to 1,600 pounds of water, that must be evaporated before combustion begins, and that the heat-producing value of garbage, when burned in closed furnaces, is about one-tenth of an equivalent amount of coal. But a preliminary drying-out of a charge of garbage and bringing it into a condition

to burn utilizes this one-tenth of the heat values, and makes the operation quicker and more economical.

If, now, to this dried charge of garbage be added a proportional amount of dry refuse, there is sufficient bulk of material to maintain combustion with little or no additional fuel; and this is precisely what is accomplished by the latest type of the American furnace.

In this improved refuse and garbage destructor there is provided a drying chamber, placed behind the front compartment, which receives the charge of saturated garbage. By dividing the lower longitudinal section of the furnace by a bridge-wall, it is possible to make the front compartment an enlarged fire-box, kept supplied with dry refuse, into which the charge of dried garbage is brought forward. The consumption of smoke is provided for by suitable combustion chambers divided by fire-brick lattice-work, which transforms all combustible elements into carbonic dioxide.

The results of the whole operation are to utilize the combustible refuse for fuel by drying and burning out successive charges of garbage, maintain the temperature, deliver the heat where most effectually employed, and thus, with no additional cost for labor, reduce the cost of operating to a rate far less than by the former methods.

c. *The value of city rubbish or dry refuse* is just now becoming understood and appreciated. Nearly everything discarded from the household, if separated and properly handled, has a market value and can be turned to some useful purpose. Within the past year a practical and satisfactory method of making this separation has been devised and put into use, and in two cities works have been established and are now operating.

The history and results reported from the Refuse Disposal Station of New York City will be the subject of another paper, and need not be here described. The construction, in another city, of a larger and more efficient plant devoted entirely to this work is most significant as a sign of progress in the art of waste disposal, and as indicating what will be the future action on this question. What is now being done in New York and Boston can be done anywhere with equally good or better results.

THE BOSTON REFUSE DISPOSAL STATION.

In 1895 the Board of Health of the City of Boston recommended the erection of a furnace to destroy the combustible waste which was then dumped with the ashes at various points or conveyed in scows down the harbor and thrown into the sea. The board renewed this recommendation in their reports of 1896-97, and in April, 1898, the city advertised for bids for the disposal of this waste by cremation, estimating the amount at 500 cubic yards, and stipulating that the work should be done at one of the dumping boards. The four bids received were rejected as unsatisfactory, but in the September following plans were presented for a refuse disposal station, which were accepted, and subsequently a contract was made with a private company to carry out these plans by special contract.*

Through the courtesy of Mr. O'Shea, Superintendent of the Sanitary Division of Boston, I am able to give some exact details of collection service there that will be useful for comparison.

The refuse is collected from an area included in a circle of two miles from the City Hall, containing all the business district and a proportion of the resident section, the population of which is 140,000—and covering ninety-five miles of streets. The collection is made daily by twenty-four special carts holding 4 cubic yards, drawn by one horse, attended by one man. The daily number of loads varies with the season, the largest day—in October—being 140 loads=540 cubic yards; the smallest—in January—12 loads=50 cubic yards. The total number of loads from March 1st to Sept. 1st, 1899, was 7,888.

The average for the summer months may be taken at 52 loads —217 cubic yards—weighing 807 pounds net per load, or about 22 tons daily.

For the same territory and the same period—142 working days —there was collected 68,118 loads of ashes weighing 1,943 pounds per load, and 14,363 loads of household offal (separated garbage), weighing 2,300 pounds per load.

Assuming the component parts of this refuse to be the same as in New York, then 35 per cent. would be marketable; 60 per cent. is combustible for fuel; 5 per cent. is worthless, and must be

* Description of this process and the terms of its employment were described in detail by your reporter at the meeting of the Medical Society of the State of New York, Albany, February 2, 1899. Published in THE SANITARIAN, March and April numbers, 1899.

hauled away with the ashes from the destructor—which is about 17 per cent. in weight of the original bulk of material collected and brought to the works.

d. *The utilization of the surplus heat from the cremation of refuse* is a factor which must henceforward be taken into account in all aspects of this question. With the single exception of the two waste-disposal stations in New York and Boston, there are no cremating furnaces in this country that utilize the heat from the refuse, and in these only a fraction of the power is employed.

Without a lengthy test of this value of waste as fuel we cannot accurately estimate the amount of power obtainable from a given amount, but enough is now known to indicate that a great saving can be made by the adoption of measures that are proven to be successful.

Taking as the average 200 cubic yards daily collection from 200,000 people, and selecting out 35 per cent. of this as marketable, there remains in bulk 120 cubic yards to be burned. In weight this will exceed the average of 207 pounds per cubic yard, since it includes matters and articles of no value for sorting, but burnable for fuel. Barrels, boxes, bits of wood and coal, sawdust, berry crates, broken furniture, oil-cloth, matting, old carpeting, mattresses, excelsior, paper of all kinds and quality in small pieces —but large in the aggregate amount—comprise the discarded refuse.

This material fed continuously into a destructor will produce a temperature of over 2,000 degrees. Under this temperature glass, iron, sand-dirt, stone and bits of coal, if allowed to enter the furnace, will fuse into a semi-liquid mass and form clinker, that has to be subsequently broken up and removed. A boiler of 60 horse-power is maintained at maximum pressure, and the dampers must be kept open for escape of surplus heat.

There can be no doubt but that 100 horse-power can be developed and maintained for ten hours with this amount of fuel. In New York the conditions are much the same, though only the lightest parts of the refuse are burned. Probably not more than 60 cubic yards in 10 hours are destroyed, and 75 horse-power is obtained—of which less than 10 is employed.

English engineers have for years past experimented on the fuel value of various wastes, and their reports have a peculiar interest for us, since they represent accurate tests by experienced men of

high professional standing, and are officially reported for the information of the municipalities ordering the trials.

The following tabulated reports of disposal of seven different places give a clear idea of the quantities of refuse, the water evaporated, the cost of operating, and the uses for power developed.

An examination of these and other reports show that every variety and class of municipal waste is destroyed without nuisance at small cost, and that the heat produced is turned into power. It appears that about 10 pounds of unsorted town refuse and 20 pounds of mixed sewage sludge and unsorted refuse are each equivalent in fuel value to one pound of coal.

There is about 33 per cent. of residuum in weight, and 25 per cent. in bulk, left of the original amount, and this has some value for commercial purposes or municipal uses. The heat units in one pound of waste will evaporate one pound of water, though this, of course, varies with the presence of moisture, of fine dust in the waste, and other conditions.

SUMMARY OF DISPOSAL WORK IN ENGLISH CITIES.

At the beginning of this year there were eighty-one cities and towns in Great Britain employing cremation as their chief means for waste disposal. There were in use 867 cells, or separate small furnaces; and reckoning each of these to destroy 6 to 8 tons daily, then something like 2,250,000 tons of unsorted house refuse and sewage sludge are annually burned.

Of these eighty-one places, seventy-six utilize the heat developed by cremation for one or another useful purpose. Fourteen cities use the power for electric lights in the works, and eleven employ it as an auxiliary to the electric power plant of the place. At fifty-two places there are mills that grind the ashes and clinker for mortar, or crush it to suitable size for making roads or footways. As a basis for concrete work and as a substitute for sand, blocks made with destructor dust stood a strain of 40 per cent. greater than when made with sand and pebbles.

There are six cities and towns employing the steam from disposal works in the city disinfecting station—a practical and economical purpose of the highest utility and benefit. Seven places utilize this force for manufacturing manure, and eight for running the city workshops and forges. In the larger cities, to save expense in hauling, the disposal stations are multiplied, being

COMPARATIVE REPORTS FROM SEVEN ENGLISH CITIES.

Town.	*Destructor.*	*Character of refuse burned.*	*Nominal boiler capacity.* H.P	*Horse power developed.*	*Amount of refuse burned.* lbs.	*Water evaporated.* lbs.	*Pounds of water per lb. of waste.*	*Tons per cell per day.*	*Cost per ton for labor.* cts.	*Use of Power.*
Warrington	Beaman and Deas.	Unsorted town refuse.	200	200	18,508	27,800	1.5	16	19	For operating 17 engines for making manure, lighting the works, city shops etc.
Warrington	Beaman and Deas.	Unsorted refuse from Collins Green Colliery.	200	200	13,272	28,000	2.11	18	17	*Note.*—Town refuse brought to Warrington destructor for special test.
Warrington	Beaman and Deas.	Town refuse from Leeds.	200	127	53,536	61,344	1.44	23	18	*Note.*—Town refuse brought to Warrington destructor for special test.
Leyton	Beaman and Deas.	Sewage sludge and town refuse.	 100	 133	25,116 49,840	31,920	.50	16	32	For lighting works, making mortar and in city workshops.
Oldham	Horsfall.	Town refuse.	120	120	106,980	78,600	.88	8	20	Auxiliary power supplied to city electric light station.
Lougborough	City furnace.	Town refuse.	90	90	35,000	70,000	2.	12	27	Employed exclusively in pumping sewage. Annual saving in coal, $2,000.
Rochdale	Meldrum.	Town refuse.	180	120	26,240	31,552	1.64	10	20	Operating engines for lighting works, making manure and mortar, etc.

placed in different locations—sometimes in the centre of a thickly populated district. London has five disposal stations, Liverpool three, Glasgow five, Bradford four, Birmingham three, Leeds four, Manchester four, etc.

At nineteen places the sewerage works are operated wholly or in part by the power from the destructor plants. At one city there are thirteen cells operating at a cost of 12 cents per ton of refuse destroyed, developing 250 horse-power, daily generating steam for pumping three million gallons of sewage through a 20-foot lift, operating air compressors for lifting sewage from precipitating tank, driving mortar mills, producing electric lights for the works, and supplying power for the shops and forges of the city service. The steam power obtained from the burning refuse is sufficient for the purpose of pumping and chemically treating the sewage without the aid of other boilers fired by coal.

A few instances may be quoted where the use of power is specially noticeable:

Bath.—Population 50,000, produces 40 tons of waste daily, collected at a cost of 81 cents per ton; cost of disposal, 22 cents per ton. The clinker—about 33 per cent. of the bulk dealt with—is used for mortar and paving slabs, and finds ready sale.

Dewsbury.—Population 30,000. A two-cell destructor consumes 30 tons per day at a cost of 26 cents per ton, developing 80 horse-power, used in wheelwrights' and blacksmiths' shops, and for crushing clinker into dust for mortar, which sells for $1.75 per ton.

Llandudno.—Population in summer 30,000. A four-cell destructor consumes 30 tons refuse daily. The works are built in conjunction with city plant for electric lighting, and the power from the destructor supplies 50 arc lights of 1,000 candle-power, and 4,000 incandescent lamps—about 80 per cent. of the whole street lighting for the town.

St. Helens.—Population 85,000. Destructor of four cells just installed; power developed, 200 horse-power, will be exclusively employed in operating dynamos for electric railroad seven miles in length, and for lighting the works and shops.

Canterbury.—Population 23,000. Combined destructor and municipal electrical works now being erected, comprising one pair of Beaman & Deas destructor cells, each required to cremate 15 tons of refuse in 12 hours, developing one pound of steam from one pound of refuse during ten hours, with accumulators for storing the current generated in daytime for night use.

Shoreditch.—The largest installation of refuse destructors and electric light works is at Shoreditch, a district of the City of London, containing 124,000 population. The location is in the centre of the district, and has also in connection public library, public baths and wash-houses, supplied with heat from the destructor station. There are 12 cells of a capacity of 8 to 12 tons per day, working continuously, evaporating one pound of water with each pound of refuse consumed, operating six water-tube boilers, 1,200 horse-power, working at a pressure of 200 pounds. The electric light being required on a large scale only four to six hours, it is obvious that an immense amount of heat would be wasted unless some means of storage were devised. This is provided for by a thermal storage cylinder 30 feet long, 8 feet in diameter, into which all the steam generated in the daytime is passed, where it is mixed with a small quantity of cold water, the proportions being such that when evening approaches the cylinder is full of water at the temperature and pressure required by the engines. The cold water feed is then shut off, and the feed water supply of the boilers connected, supplying these at such a temperature that the fuel that is then being burnt has merely to furnish heat sufficient to overcome the latent heat of evaporation at the required pressure. By this method about one-third more steam is obtained, and the waste is purified for boiler uses, and the power produced in the daytime is stored for use at night. The latest unofficial reports state that the Shoreditch works, now operating for nearly two years, are successful in every respect. The street refuse has been disposed of with a saving of two shillings per ton over methods previously in use, and electric light has been supplied at a reduced rate. Negotiations are now going on for the purchase of land and the construction of a similar plant in two other city districts. One of these will cost more than one million dollars to complete.

The example offered by this most successful experiment is being rapidly followed by other communities, no fewer than thirteen distinct municipalities in Great Britain being pledged for the construction of joint works, utilizing the destruction of town refuse for power for electrical purposes.

The cost of construction of power-producing plants comes naturally at this point, and this is a question that is difficult to answer.

The initial expense, exclusive of ground, depends upon the preparation of the foundation, the character of the enclosing

buildings, the material and height of the chimney, the length of the roadways and approaches, and the local prices for material and labor. Since the conditions and circumstances of no two cases are precisely alike, it is impossible to give exact figures; but it may be stated in a general way that a disposal plant which is to utilize the power will cost from one-third to one-half more for initial expense than one which does not employ the heat developed.

This extra item is for the boilers and machinery, and for the more massive and durable construction of the furnaces, chimneys and buildings. A destructor of the improved type, not utilizing the power, will cost but little if any more than a crematory furnace of the usual kind having the same relative capacity, and can be depended upon for greater efficiency, with better sanitary protection from nuisance.

In American towns the practical use of power from burning refuse may not at present be convenient. It is difficult to make a radical change in the present methods, owing to the fact that most city departments where power could be employed are carried on by contract with powerful companies for a long term of years, and these are naturally opposed to the adoption of any measures that may interfere with their business. But there is one instance where the use of this force is peculiarly applicable, which may be briefly noted. It almost always happens that power in some form is needed in connection with sewerage systems—usually when the sewage is to be raised to a higher level for filtration or outfall. If this point is within reasonable distance from the town, there can be saved the expense of one steam equipment by adding a destructor for consuming the town waste and sewage sludge, and transforming what is now worthless and useless into a beneficial force. This is well within the reach of even the smallest places that are compelled to adopt sewerage systems, and has been pointed out and recommended by a prominent engineer in the case of a small inland city about to put in a filtration plant; and this example, if only fairly successful, will be followed by many others.

COMPARISON OF AMERICAN AND FOREIGN METHODS.

Considerable space has been given to the description of foreign work for the reason that it seems to give economical and efficient returns that are far in advance of our own practice.

It now remains to be seen if the conditions and circumstances that obtain in American cities are the same as those abroad; or if

there can be devised in this work of disposal a similar use of means and measures that will give equally good results.

In considering this point we are hampered by the fact that not a single American city has thought it worth while to make any official test of furnaces or apparatus for reduction, or to collect and publish accurate information as to the relative proportions or weights of the component parts of municipal waste.

The only partial exception is New York City, where the system of reports instituted by the late Colonel George E. Waring, and the method begun by him for collection and treatment of a part of the combustible refuse, has been continued by his successor. This information is a most valuable contribution to our knowledge on this question, and is included in the paper by Mr. Macdonough Craven, read at this meeting.

Through his courtesy, I am able to quote some facts applicable to our inquiry.

For 1898 the total amounts of waste collected in Manhattan and Bronx boroughs of New York City was:

Ashes, excluding street sweepings.....	1,121,000
Garbage	170,000
Refuse	102,000
Totals tons of 2,000 pounds.....	1,393,000

Taking the population of the boroughs as reported by the State Board of Health, 2,048,830 would give 680 tons per 1,000 people; or, 1,360 pounds per capita per annum. The estimates by the best authorities for the city of London give 250 long tons per 1,000 persons, or 560 pounds per capita per annum; and in Berlin the figures are 315 pounds, and in Hamburg 345 pounds per capita per annum.

These figures show an enormous percentage of waste produced in New York over foreign cities, due largely to the facts that it has a large transient population; that this is a great receiving and distributing point for the whole country; that the city is more compactly built—the ground completely occupied—allowing no storage room or any means of disposal in the house; therefore everything must be sent away.

But the wastefulness and extravagance of the American people in the direction of household products has long been noticed and

commented upon by foreign observers; and it has been stated as fact that, in the matter of food alone, enough is thrown away daily, if it were properly cared for, to sustain nearly one-fourth of the whole population. This wastefulness is characteristic of all American cities, but not in so large a degree as in New York, owing to conditions that do not obtain elsewhere.

The component parts of municipal waste must be known before one can obtain an idea of their value for any useful purpose. The following table, compiled from the best foreign authorities, and including what is accessible here, will give some details not previously published:

The following table shows that there is no radical difference in the general character of municipal wastes here and abroad. There is here a greater amount of garbage containing more water in suspension, a larger proportion of coal, and more combustible refuse comprising articles and items that are not discarded from foreign homes—a striking instance of American abundance in all relations of home life.

The value to be obtained from the dry refuse of municipal waste in market products depends something upon the nearness to factories where these articles are worked up and transformed into new material; also upon the demand and supply for certain items, like paper cardboard, etc., which are the largest in quantity. Broadly speaking, every thing has a value and can be sold at some price, and, when taken together, will return a revenue equal at least to the cost incurred for the expense of separating and sorting.

When the whole of the combustible portions of the waste is converted into power, then the figures rise at once to greater magnitude. For the purpose of illustration, suppose we consider the theoretical value of the New York waste. Assuming the amounts to be those already stated, and the value in steam power as indicated by the reports quoted, we should have something like the following:

35 per cent. of ashes=1,121,000 tons.....	392,350
50 per cent. of refuse=102,000 tons.....	61,200
10 per cent. of garbage=170,000 tons.....	17,000
	470,550

tons of fuel—equivalent to 47,000 tons of coal, taking ten pounds of miscellaneous waste as equivalent to one pound of coal.

		NEW YORK.		LONDON.				BERLIN.		BOSTON.	NEW YORK.
AUTHORITIES.		CRAVEN.		MAXWELL.		CODRINGTON.		HERING.		O'SHEA.	Components of ashes and per cent. of 100 parts marketable articles in refuse.
COMPONENT PARTS.		Per cent by weight.	Totals.	Per cent by weight.	Totals.	Per cent by weight.	Totals.	Per cent by weight.	Totals.	From 140,000 people.	
ASHES	Coal	16.10	....	.84	....	.15	....	.17	....	....	20
	Breeze Cinder	12.07	....	63.69	....	28.80	....	2.64	....	....	15
	Fine Ash	52.30	80.47	19.51	84.04	52.60	81.55	50.16	52.97	75.58	65
GARBAGE	Vegetable and Animal Matter	12.20	12.20	4.61	4.61	14.20	14.20	32.54	32.54	20.49	12.20
REFUSE	Paper	5.46	....	4.28	....	....	....	4.26	....	....	74.5
	Rags, Clothing, Bagging, etc	.89	....	.39	....	.43	....	1.15	....	....	12.2
	Carpets	.24	....	....	....	....	....	....	....	....	3.3
	Bottles	.18	....	.96	....	.30	....	....	....	....	2.5
	Metals	.15	....	.21	....	.37	....	.20	....	....	2.1
	Tins	.10	....	.79	....	....	....	.58	....	....	1.4
	Leather	.13	....	....	....	....	....	....	....	....	1.9
	Rubber	.01	....	....	....	....	....	....	....	....	.2
	Barrels (Whole)	.10	....	....	....	....	....	....	....	....	1.4
	Bones	....	....	.48	....	.25	....	.53	....	....	....
	Wood	....	....	....	....	....	....	.40	....	....	....
	Glass	.03	....	.47	....	....	....	1.27	....	....	....
	Crockery	....	....	.55	....	2.90	....	6.10	....	....	....
	Straw, Fibre, etc	....	....	3.22	....	....	....	....	....	....	....
	Other Salable Material	.04	....	....	....	....	....	....	....	....	.5
Totals		....	7.33	....	11.35	....	4.25	....	14.49	3.93	....
Total Percentage		....	100.	....	100.	....	100.	....	100.	100.	....
Combustible Refuse for Fuel (New York)											60.
Incombustible Refuse (New York)											5.
Marketable Refuse (New York)											35.

The first column contains percentages of the 35 per cent. of marketable articles found in New York refuse. Here shown for purposes of comparison with other cities. The last column is the same percentages differently expressed. The totals only are given for Boston—no details being reported. The percentages for London and Berlin are based on the whole city collection.

Taking the average of power developed under usual conditions at a conservative estimate per horse-power per annum in New York City and adding to this the value of the sorted refuse at the present market price and we shall have, approximately, $500,000 as representing the fuel and marketable value of the present yearly collection of New York garbage, ashes and refuse. From this must be deducted the cost of transporting to place of final disposal the 20 per cent. of residuum left after destruction by fire, the cost of which is more than defrayed by the value of the land created by these ashes.

The statement made some years ago by the late Col. Waring, to the effect that the waste of New York was worth some millions of dollars per annum, was probably based on some such estimate as this, adding also the utilization of the steam power for electric lighting or manufactures.

Col. Waring's last published predictions of a recovery from the sale of refuse material, at one-half the whole cost of the street cleaning and disposal work, seems now likely to be in a fair way to be put to the test by the action of the present Commissioners, who will presently begin the erection of the first refuse disposal plant of large capacity at one of the city wharves.

Judging from the reports quoted from, it is evident that there is a very considerable value in municipal waste, when properly treated, which is derived from the saving of marketable articles, and the employment of the enormous force acquired from the cremation of worthless matters.

The means for all these methods are now available. The utilization of power is a question of the near future, and it is only reasonable to say that when once it is determined how much, how often and at what price this power is to be had there will open a way for its use.

Meantime the additional expense for producing the power is not a large factor in the equation, inasmuch as it secures absolute immunity from the nuisance of dumps, destroys the waste without insanitary consequences, saves a considerable sum in transportation and provides in the residuum a material for various useful purposes.

But a change must be made in the present manner of determining what is needed and deciding upon its efficiency. This subject of waste disposal is at a stage where it must be considered as much a part of the municipal service as sewers, or gas, or water supply and treated with the consideration the subject demands.

We are only too familiar with the way this question is now often handled. After the initial remonstrance and petition for a new order of things—which springs from the health authorities, who first recognized its importance—comes the somewhat tardy action of the Mayor calling attention to the subject; the tour of inspection by the Council Committee; a deluge of pamphlets, circulars and letters; the keen hunt of furnace builders and ambitious companies anxious to save the city all worry and trouble—for a consideration; the contradictory bids, tenders and offers that no man can reconcile; then the rejection of everything—and the repetition of these proceedings until everybody is sick and tired of the whole business, the prize at the last falling to him who is longest winded —and the city gets a bad bargain that makes endless trouble in the future.

But there must be a better way. Suppose it is determined that some one of the modern methods of waste disposal is needed, the city engineer would be instructed to procure the latest reliable information of methods and apparatus. If necessary, he would be authorized to call in an expert on the subject for assistance. He would carefully compile this information and with it the accurate account of amount and character of city waste and add the suggestion of what may or may not be done in the utilization of refuse and of power from destructors. With this report in hand, the authorities would be in a position to determine what are the apparatus and methods available, and a careful inspection—and, if possible, a trial—of the best be made by competent men. Then bids are asked for under such definite conditions as are equitable and fair—not expecting the impossible to be accomplished offhand, but giving some freedom and latitude within well-defined bounds, and then holding to strict fulfillment of the contract on both sides.

Under most conditions it certainly is desirable to accept the offer of private companies that are in a position to undertake this work, but if this is done there must be granted a term of years for the contract, to give a sufficient margin of time in which to repay the fixed charges of construction and operation of the plant and to realize a profit.

Ten years of garbage-disposal work in American cities has seen the establishment of sixty-five furnaces in fifty-four cities and towns, besides the trial and failure of about ten experiments of one kind or another in crematory furnaces. The same period has witnessed the construction of twenty large and expensive plants for

the reduction of garbage by mechanical and chemical methods. Of these eight now survive, and of these only three or four are reported to be satisfactory and economical, among the latter being those of New York, Philadelphia and Boston.

The expense of construction in these furnaces has not been large nor the cost of maintenance excessive when compared with the results accomplished. From the beginning the tendency has been to overrate the capacity and efficiency of the furnace and underestimate the quantity of waste produced, for it always happens that when a way is provided for disposal of worthless matters the quantities invariably increase. When compared with what is yet to be done, what has actually been accomplished is of small magnitude. Because of the limitations of the furnace capacity in consequence of its principles of construction there is no example on a large scale of the disposal of all classes of waste by cremation. The smaller cities and towns have found cremators useful and efficient, but limited strictly in capacity and performance. The large cities, with one exception, have not ventured upon their adoption, though there has been shown a willingness to put them to trial under conditions that could hardly be met—the destruction of all kinds and quantities of miscellaneous matters at small cost.

Finally: We have reached a turning point where some larger and more efficient means must be brought forward if the best disposal methods are to be adopted. Clearly the great interest shown in the subject and the growth of public sentiment in favor of the sanitary treatment of waste has created a demand that must be met.

The example of two cities in turning to account such part of refuse as can be easily selected from the general mass indicates what may be done in this direction. When once separation is determined upon and the householder fully acquainted with the necessity and expediency of this measure he readily falls into line and cheerfully contributes his personal quota to the general reform.

We can depend confidently upon a sure revenue from what has previously been thrown out as worthless, if not in articles and substances saved and sold, then in fuel value for other uses.

While American cities have been slowly working out the problem of waste treatment, the cities of other countries, proceeding on parallel lines, with a wider experience born of a stern necessity for the sanitary disposal of the wastes of a crowded population, and with far more liberal expenditure of funds for this department of municipal work, have gone more directly to the end and reached

conclusions that apply equally well everywhere. Why may we not profit by the example set us and turn into power the useless matters we are burdened with?

There is no good reason to be urged against this. The inventive genius of the American engineer will speedily find means to adopt methods and measures that are labor and money saving and find uses for power that, so to speak, is created out of nothing. Give him a chance to do this, and the cities of America can realize the prediction of scientists who, three years ago, said that each community may be served with electric light created from the natural waste and outcast substances for which we now pay huge sums to get rid of.

From a consideration of the relative methods of disposal in use in this country and comparing these with those which are found in favor abroad, we may fairly draw the following conclusions:

First. But two ways or means for dealing with this question are available, and the relative advantages and special adaptations to the local conditions can only be determined by scientific and expert investigations and comparison. The subject has gone beyond the speculative and experimental stage and reached the point where more definite and exact knowledge is needed. This can best be had by calling in the assistance of experts who will make full examinations and submit reports covering the whole ground.

Second. The indications are that a combination of the two systems of reduction and cremation at points where the two can be advantageously combined because of the presence of sufficient quantities of putrescible garbage is the ideal way in which to treat city waste. Each of these methods, developing along parallel lines, has come to a place where they begin to converge to a common point. Reduction has demonstrated its ability to secure a percentage of value at greater or less cost, according to the amount of garbage treated, but it does not provide for the still greater proportion of city waste left untouched. Cremation destroys the combustible and a proportion of the putrescible and recovers little or nothing of value in the process, but the employment of the heat derived from cremation furnishes an additional source of revenue that should now be utilized.

Third. A city which has or will put into force a system of separation and collection of garbage, ashes and refuse, and will erect a disposal plant which shall proceed by treating the garbage, when in sufficient quantities, by the modern improved process of extracting

the valuable commercial products, and shall operate its plant by the steam power which is obtained by the combustion of such worthless parts of the dry refuse as may be left after sorting out the salable portions, and that will, in addition, bring to this point such proportions of ashes from houses as can be utilized for fuel for the destructor, will then have all its waste disposed of in a way entirely sanitary and will realize a profit in the operation which, in a comparatively short time, will repay not only the cost of the works and their operation, but will return in steam power, when utilized for electrical purposes, a very considerable amount of profit.

Fourth. When the quantity of garbage produced is insufficient in amount or impracticable for treatment by reduction methods there can be erected a general waste disposal station, which will receive everything in a mixed condition, and, by employing the best available destructive agencies, transform the worthless matter into electrical energy, to be used as principal or auxiliary power for street lighting or other useful municipal purposes.

Fifth. Any small city or town can employ destructive methods for its waste disposal, with guaranteed immunity from nuisance, at a smaller relative cost for operating the works than has been known since the beginning of this treatment, twelve years ago.

SALT WATER AND FIRES.

Ninety-eight fire companies have petitioned the authorities of this city to do just what the *Insurance Monitor* urged a quarter of a century ago: utilize the water which surrounds this city in putting out its fires. Those old diagrams, showing the elevations and just where hydrants could be profitably placed, may be found in our early files. But we were ahead of the times, and the underwriters of those days believed that the water damage would outweigh the benefits. The experience of other cities has taught them better. It is cheaper to put out a fire with salt water than to let it burn, and cheaper to use salt water than to depend on private capital to supply the fresh.

Underwriters want no Ramapo jobs in this or any other city if public ownership of the water supply is possible. Lack of municipal control has been the curse of the volunteer department. To put out fires is the business of the city and the water, like the engines, should belong to the city.

THE ARID REGION OF THE UNITED STATES FOR PULMONARY TUBERCULOSIS.

By J. O. Cobb, M. D., of Fort Stanton, New Mexico;
Passed-Assistant Surgeon, United States Marine Hospital Service.

I take an opportunity in this paper to answer the great many inquiries that have come to me from physicians and others by giving information through the *Medical News** direct to physicians relative to this section as a climate for their consumptive patients. As I have no local interest I can probably speak without coloring my statements with Western prejudices.

What actual knowledge I possess of the arid region has been gained by a residence here this summer, last spring, and last winter, during which latter season I was sent through Arizona and New Mexico to inspect Government reservations for the purpose of recommending the selection of a site for a sanatorium for consumptive patients of the Marine Hospital Service. In this connection I wish to call attention to some of the points of interest which impressed me while on this trip, and which may be useful to the physician in sending his consumptive patients out here for the climatic cure of the disease.

First and last, I am firmly convinced that any part of Arizona, Colorado, New Mexico, Mexico, or Western Texas above 2,000 feet elevation is as good as another part for the acute case without complications, other things, of course, being equal, such as proper food, etc. I know that a large percentage of such patients sent here rapidly and permanently recover. Let me emphasize that for men in the acute stage one place is as good as another in the sections named so far as altitude is concerned. If the patient has friends, or if it is known that he can obtain all the necessary care at any particular place in the sections above named, let him be sent there. For women, those in an advanced stage and those with a tendency to hemorrhage, care must be exercised to select a site at a medium altitude; patients with stenosis must never go to a high altitude.

* Of October 21st, of which this is a reprint.

I believe that for the average patient the climate of El Paso is as good as that of Colorado Springs; Albuquerque as good as Fort Stanton; Tucson and Phœnix as good as Prescott; Chihauhua and Aguas Calientes as good as the City of Mexico. These places represent the average of each section, and if the physician has a patient in either, and he has all the other absolutely necessary requisites for his comfort, care, proper food, and peace of mind, then one need not worry, for all will have been done that can be done. I have met numbers of patients out here who have tried each place, and, of course, wherever one began to improve that was the place of all others. It is surprising what a vast fund of knowledge relative to climate, rainfall, altitude, and a thousand other unnecessary things these poor unfortunates pick up. I recall a case in Phœnix which I found to be fairly typical of the consumptive sent out to this country. This man, who was just ahead of me at the ticket office, interested me by calling for a ticket to Chicago, and seeing that he was very sick with tuberculosis I naturally made an opportunity to speak to him and inquire why he was returning to Chicago. He explained that thirty-three days before he had landed at Albuquerque, and as he could not notice any difference after a week's stay there, and being told that it was too high, he went on to El Paso, and from there still lower to Tucson. As I was much impressed with that beautiful little city, I asked him why he left Tucson. "Oh," he said, "it was too dry, and they have such awful dust storms." I asked him how many storms they had while he was there, and he said only one, but he knew he should die if he had to live through another. So he had come to Phœnix, and was leaving there because the place was ruined by too much irrigation of the alfalfa fields, and was, therefore, too wet.

Who was responsible for sending this poor, foolish man out here without sensible instructions to aid him to bear up against all the natural drawbacks to be found in a newly settled country? If one expects the climate to do all he will be wofully deceived. If the cases are diagnosticated early and the patient sent here promptly, I believe at least eighty per cent. will recover with outdoor life, good food, and attention. Of course many patients will recover with only climate as an aid in spite of all hardships. Truly, though, I have been unable to find many of these.

Do not fail to impress upon your patient that he is to come out here to make it a business to get well. He must understand that

the towns are small, nearly all the hotels poor, and the boarding-houses even worse. There is very little beautiful scenery outside of Colorado. There is much that is dry, brown, dusty, and some that can be called grand though sombre. The barrenness of the arid region in Arizona and New Mexico is appalling to the new-comer. The monotony of the ever-present sunshine, the dust, and the high winds make the sick and the well long for a drop of rain; and then add to this poor food and unsatisfactory accommodations, and it requires some courage on the part of the patient to remain here. Then let it be understood that coming here is a serious business, and that the stories of hunting and fishing (the latter especially) and other sports are exaggerated, and generally entirely untrue. Then, too, in all arid regions of the world dust and winds prevail, and I can see no reason to deny that there is a great deal of dust and high winds all over the sections under discussion. Let it be understood that there are many unpleasant features, and the disappointment will not be so great.

The consumptive must not come here believing that it is warm just because there is so much sunshine. At Las Cruces last January it was a little too warm at mid-day for long walks, while in the evening one required a heavy overcoat, and at night heavy blankets. There is a very marked difference between the mid-day and midnight temperature, and it is absolutely necessary to come prepared for cold weather, and flannels will have to be worn all the time.

I have noticed one thing out here which is very disgusting, and that is that the pillows and bedding have the odor of perspiration so peculiar to the consumptive. Every health-seeker should buy pillows and blankets and carry them wherever he goes if he desires comfort and cleanliness. Every place seems to have the abominable cotton-padded "comfortables," which cannot be and never are washed. In a large hotel I found that I had to spend a night under one of these foul things, and I noticed next morning that it had several large spots of dried sputum on it. If one wishes to feel comfortable and be free from disgusting odors let him carry his own pillows and blankets. Besides, if one always has the same covering there is not so much danger of catching cold.

Never believe that the room offered to you has been properly disinfected; also, never believe that a consumptive has not preceded you. I call attention to this for I believe that many persons with mild cases become reinfected here by occupying rooms which

were formerly in possession of persons ill in the last stages, and I have heard of a few individuals who had come out with relatives and later contracted the disease, probably by occupying infected rooms.

Physicians should especially direct their patients in the management of the sputum. I never dreamed that man was such a filthy animal until I visited Tucson, El Paso, and the other places where consumptives go by hundreds. I never saw anything more disgusting than the walks in the plaza at El Paso. The efficient president of the Board of Health of that city has made many enemies and brought a great deal of abuse and ridicule upon himself by fighting this dangerous nuisance, and at last he has succeeded in having a law passed forbidding spitting in the streets. I believe he has sufficient temerity to enfore the law. At any rate, it is our duty to aid him by careful instructions to our patients. The patients should be taught not to cough in public places, and to use the sanitary sputum-cup or pocket-bottle.

There has grown up in the Western country a spirit of exaggeration in respect to each locality that, to say the least, borders on the untruthful. Each place has all the virtues, while its nearest neighbor is nothing but a death trap. The expression is often heard that no consumptive was ever known to get well there. Even the doctors join in such silly expressions, and often display a spirit that I am sure is engendered by their own local interest. I am sorry to say this, but I believe it to be true. Especially is this true of their actions toward places of different altitudes from their own. Then, too, wherever one goes every citizen can tell you the average rainfall of his section for years, and he is ever ready to direct your attention to the statistics of other localities that are wetter, but never to those that are drier, for his desire to furnish you with necessary information never reaches that far.

The places mostly frequented range between 2,000 and 7,000 feet in altitude, and some are as high as 8,000 feet. The greater the altitude the greater the rainfall, and consequently the less dust and more luxurious vegetation; the lower the altitude the greater the barrenness and prevalence of dust storms. Don't let your patients worry about the rainfall, for there is practically none in winter anyway, and in summer what falls is in downpours which runs away or is rapidly absorbed. The country would be much better if there were more rain.

I want to impress upon physicians the importance of mapping

out to their patients the different discouraging problems which they are sure to encounter. I have taken every opportunity to talk with the doctors and consumptives out here for the purpose of ascertaining their trials and hardships. In a few instances I have found patients who were here under full and intelligent instructions, and who were ready to laugh at the bad food and discomforts, and were making it a business to get well. It does one good to meet with some patients sent out by doctors with sensible directions, even though in nearly every case these doctors have never been here. These are the patients, too, that are doing so well, and in each the diagnosis had been made early.

There has grown up an absurd idea that individuals with destructive valvular lesions cannot live in any altitude above 2,000 feet. A little thought will convince one that the average lesion case without stenosis will do even better here than at the level of the sea, especially if compensation has taken place. I have failed to examine one consumptive here who has not referred to his heart and asked if I thought it would stand the altitude. I have examined a few patients who had been directed to leave the high altitude and go lower "on account of their hearts." There was nothing the matter with their hearts except in two instances, and these had irritable hearts from too liberal use of tobacco and coffee. Even the well person cannot smoke and drink tea and coffee with impunity without a feeling of fulness and distress in his chest. This is especially marked at an altitude of 5,000 or 6,000 feet. I believe much of the dizziness and fulness of the head at high altitudes is due to the use of coffee, tea, or tobacco.

Pulmonary hemorrhage is a question about which I am unable to offer any positive opinion, but one which I have investigated carefully. Physicians residing in the greater altitudes deny that their patients are any more likely to have hemorrhage than at a much lower level. I cannot very well believe that, for the reason that the higher one goes the greater is the relative action of the heart. That is plain, for as we take off the air-pressure we are lowering the "governor," and the heart's action is accelerated and will "race," for there being less air-pressure there is necessarily greater relative pressure from the arterial tension. It seems, then, that if the wall of a blood-vessel were already weakened there would be danger for the consumptive to go at once to a high altitude; therefore, if the patient has shown a tendency to bleed and there is a cavity present, I would suggest that he be started in at a medium altitude and gradually ascend.

Tubercular pneumonias involving small portions of the lung are quite common, I am told, and I believe are more often noticed in high altitudes than in lower ones. The newly infected area softens rapidly and a cavity forms at that point.

Consumptives with large cavities rarely recover if they have high temperatures and the cavity is infected with the steptococcus. It is admitted by all that these patients seldom if ever recover in an altitude above 5,000 feet. One of our large sanatoriums here refuses to accept such patients, but it is the unexpected that often happens in such cases. I know a woman with a cavity as large as an orange, and one can hear the gurgling in this cavity two feet away, and yet she has gradually improved, and I think will recover. She has been here three years in an altitude of 3,800 feet. I also know a man with a cavity the size of a lemon, stuck up against the anterior wall of the thorax like a swallow's nest. He has no other trouble, but still expectorates bacilli from this cavity. His case dates from 1867. Most of his time has been spent in El Paso, but he has also lived in Colorado at a greater altitude. I merely mention these cases to show that some of the patients so afflicted do get well, though they are few.

The physician in the East must be very careful in sending women here. Women often have irregular and scanty menstruation as the first symptom of the disease. Almost surely if they are sent to altitudes above 3,500 feet they begin to menstruate freely and often dangerously. There are few women who are not troubled in this way when they first come here. I have heard of some who began to menstruate regularly after going to a high place. I think, however, that this was due to the general improvement of their health. I knew one young girl who usually had a hemorrhage from the lungs at the menstrual period, though she had no sign of uterine flow. She had a large cavity, and has nearly recovered.

Nearly all women are very nervous during the first few months of their residence here. They are highly apprehensive of impending danger, especially during high winds and dust-storms, and one expressed her feelings very clearly by saying that she had an almost overwhelming apprehension of the heart. Men have this feeling also, but not to such an extent. I am in absolutely perfect health, yet even now if I drink strong coffee or tea I have a very disagreeable sensation in my chest. It is nothing more than the heart going too fast for aeration of the blood. This

can be stopped in half an hour by walking for that time and then lying down.

Women also have dyspepsias worse than men, and they do not sleep so well. With them, also, constipation is hard to control. High winds cause the air to become electric, and then one is stimulated and is buoyant. The dry air seems to drive away the blues even of the sourest patient. I notice that the consumptive here is more hopeful and happy than in the East.

If the diagnosis is made early, before complications have taken place, I believe that eighty per cent. at least of the patients sent here in that stage will recover. A great many who appear hopelessly sick at the East will also recover or the disease will be arrested. In spite of the dust people with laryngitis improve wonderfully in a short time. While at Las Cruces last December I played ball with two young men, one of whom had been brought to that place on a stretcher fourteen months before. While at college he had eleven hemorrhages, when he contracted the disease. He promised to allow me to examine him, but I had to leave and never saw him again. He said that so far as he could tell he was perfectly well. The other case was one of twelve months' standing, and the man thought himself well, though I easily found the infected area in both apices. Near Fort Stanton is a young man following a flock of sheep. He herds them night and day, sleeping on the ground. To see him now no one would believe that a few months ago he could scarcely walk, and that only will power kept him alive. Another patient came in June and camped near the Reservation. He had a large cavity and mixed infection. He could not walk. Now he has very little fever, and rides and walks a great deal. It remains to be seen if this patient with mixed infection will eventually recover at an altitude of 6,126 feet. These are only examples of nearly one hundred cases that I have seen incidentally, and some patients who have been here a number of years show no signs of the disease, and I have to take their histories for the correctness of the diagnosis. One can hardly believe that they were tuberculous and had recovered.

In the case of extensive dry pleuritic adhesions of both lungs, as a complication, I am told the patients invariably die when at an altitude above 2,000 feet. All women should start in at an altitude of about 3,500 feet, and ascend if they have no complications. Patients with a tendency to hemorrhage should not go to high

altitudes. Persons with valvular lesions as a complication should be started in at a low altitude because very little exertion will set the heart racing and badly frighten them in spite of the explanation that there is no danger. Persons with stenosis should never be sent above sea-level. Physicians are advised to keep their bedridden patients at home to die in peace. This country is bad enough to live in, and it certainly is hard to die here. It should not be forgotten that the trip is hard for a well person; for the sick it is a hardship. Individuals with one side badly affected and large cavities should submit to the Murphy operation before being sent out. If such are sent to places as low as Phœnix and Tucson there is a good chance for them to recover. If the patient has big cavities on both sides he must not go above the level of San Antonio, Tucson, or Phœnix, and even at these places the chances are against him.

Colorado is so well known I shall not attempt to name any place in that State. Arizona, New Mexico, and Western Texas are the parts of the arid region that I think are most desirable. As I said before, one place is as good as another in this region as far as the climate itself is concerned. For those in the acute stage the climate alone will cure most of them, and therefore it makes very little difference where they go. For those in whom the disease has advanced sufficiently to give rise to high fevers and dyspepsia, and who are easily chilled by the least exposure to cold it is necessary that the very best cooked food and attention be given. It is this class of patients which has aroused my solicitude especially. I have seen a number of them die and know that a great many die that should have been saved. A large percentage of these unfortunates obtain the glaring advertisements of some place with a Spanish or Indian name and are induced to try its extolled virtues. Their disappointment is woful. The food and lack of attention would make the well sick. Patients should be kept from the small Western towns and from the ranch. There is not one ranch in five hundred where one can obtain a palatable meal. With thousands of ranch cows about one rarely sees milk or butter at one of these places.

This arid region, which includes a large section of Mexico, has been pushed up, as it were, from 2,000 to 8,000 feet above sea level. The climate has been changed and modified to such an extent that it is entirely different from that which one would notice merely by going up to a high mountain. With a temperature of

more than 90° F. in the shade one does not perceptibly perspire. The air is full of electricity. If I had the choice I should prefer to have consumptive patients here in summer rather than in winter. I believe it a great mistake to send patients here in winter and allow them to return East to spend a miserably hot summer, losing all they have gained. The consumptive will flourish in dry cold and succumb to moist heat. I have yet to see more delightful weather than that of last spring and summer, during which time I was at El Paso, in the Tularosa Valley, and here at Stanton in the Sierra Blanca region. In the Rio Grande and Tularosa valleys the sun is blazing hot, and yet there is nearly always a breeze and one can find comfort in the shade.

Here at Stanton the spring, summer and so much of the fall as has passed have been absolutely perfect. No one could find anything to add to it. The record for more than twenty years shows mild winters, with high winds in February, March and April.

Let me again advise against sending patients to small towns. El Paso, Phœnix, Albuquerque and Tuçson are bad enough. Even in these towns with few exceptions there are no first-class, up-to-date hotels. In El Paso, with its enormous transient travel and its large amount of business, there is only one medium class house worthy the name of hotel; and there is not one good restaurant. Albuquerque has recently lost its fine hotel by fire, and now there is no place for the wealthy consumptive to go to in that city, for no one would tolerate the hotel accommodations there if he could help it. Phœnix has a very nice hotel in the Adams House. At Eddy there is a fair hotel, but I am told that the dining service is miserable. At Tuçson there was a nice little hotel, but I hear that the proprietor has moved to El Paso. It is to be hoped that El Paso will gain by this change.

Las Vegas Hot Springs is probably the best place for the patient with means. There is a large sanatorium there, run on the hotel and cottage plan. A consumptive can go there and spend the entire year in comfort. The Catholic will find at El Paso the Hotel Dieu, a modern, up-to-date hospital and sanatorium of which he can well be proud. Ground has just been broken at Roswell for a sanatorium and it promises to be a great success. Roswell is a coming town. At Alamogordo I found the most comfortable hotel in Arizona or New Mexico. It is a small house, but clean, and the dining service is excellent.

It thus practically resolves itself to the necessity of the con-

sumptive procuring board with private families, keeping house or having miserable rooms with miserable meals at miserable restaurants. I want to make one exception in regard to restaurants, and that is, wherever there is a Harvey eating house one will get first-class meals. Harvey makes a business of superintending the meal service on the Santa Fé system, and his meals are excellent.

In El Paso I know of only one good boarding-house. In Albuquerque there are said to be several. Patients reaching any town had better go to a European-plan hotel and get meals outside. They can then inquire for and find boarding places. Examine the railroad cards and if any place has a Harvey house, go there. A woman can always feel safe in going to a Harvey house.

Throughout Arizona and New Mexico one will find society of the best sort. The pulpits are often filled with educated and refined ministers here for their health. It is the same with all the professions, and one need not fear that he will not find cultured and refined people, for they are everywhere though they are sick. The poor man must come prepared for exorbitant charges. From the start he had better have his own home or be sure of his friends. All kinds of attractions are held out to settlers, but one must bear in mind that a farm cannot be commenced here for a small sum as water alone is a big item of expense. There is not a drop of water near irrigable land in either Territory not already preëmpted. The digging of wells is usually a costly experiment. The well-to-do can always make a home with sufficient comforts.

DIRECTORY.

Las Vegas, N. M. Hotels fairly good. Boarding. Patients can remain winter and summer. Altitude, 6,418 feet.

Las Vegas Hot Springs, N. M. "The Montezuma;" good attention of all kinds. Patient can rent a cottage and have meals in the main dining-room. Hot baths. Patient can remain all the year. Advanced cases not received. Altitude, 6,709 feet.

Santa Fé, N. M. Hotels only fair. Boarding. Greater number of clear days than any place in New Mexico. Summers perfect. Patients can remain all year. Altitude, 7,047 feet.

Albuquerque, N. M. Hotel accommodations poor (fine hotel just destroyed by fire). One good restaurant where ladies can go. Boarding. Fine drives. Patients can remain all year. Has best altitude, 5,000 feet.

Las Cruces, N. M. Very poor hotel. At the "Alamada," three

miles out of town, one will find good meals, though other accommodations are very poor. Part of the year very hot. Winter perfect. Must make arrangements by correspondence before going there. Altitude, 3,797 feet.

El Paso, Texas. Several European plan hotels (others being built). One good boarding-house. Good driving. Fine business town. Good place for the workingman. Summers very hot. Winters perfect. Altitude, 3,720 feet.

Deming, N. M. Fair hotel, but good meals. Beautiful country. Small town. Can remain all year. Altitude, 4,327 feet.

Hudson Hot Springs, N. M. (near Silver City). Sanatorium. Said to give good care and attention. Can remain all year. Altitude about 5,000 feet.

Tuçson, Ariz. Beautiful old Mexican town. Beautiful drives. Fair hotels. Boarding. Hot in summer. Delightfully warm in winter. Patients should leave there in summer. Altitude, 2,392 feet.

Phœnix, Arix. Beautiful city. First-class hotel, "Adams House." Boarding. Nicely kept streets and beautiful drives. Patients should leave in summer. Altitude about the same as that of Tuçson.

Prescott, Ariz. Hotels poor. Summers delightful. Altitude about 5,000 feet.

Flagstaff, Ariz. Fairly good hotel. Small town. Beautiful country adjacent. Grand Cañon of the Rio Grande sixty miles away, and the San Francisco Mountains nearby, with an altitude of 12,000 feet. Fine summer excursions. Altitude of Flagstaff, 6,862 feet.

Alamogordo, N. M. Hotel first-class, though small. Small town, eighty-six miles from El Paso. Hot summer. Stopping place en route to Cloudcroft. Altitude about 4,400 feet.

Cloudcroft, N. M. Fourteen miles from Alamogordo in the Sacramento Mountains. Six thousand feet elevation. Used as a resort in summer by people from Western Texas. Said to furnish first-class meals. Summer resort only. Ride on mountain railroad very fine.

Eddy, N. M. Fair hotel. Small town. Altitude about 4,000 feet.

Roswell, N. M. Poor hotels. Boarding. Will have a fine sanatorium for consumptives, to be opened this winter. Hot summers, delightful winters. Beautiful drives. Surrounding country good for the poor man to get a start. Altitude about 4,000 feet.

AMERICAN PUBLIC HEALTH ASSOCIATION.

TWENTY-SEVENTH ANNUAL MEETING, HELD AT MINNEAPOLIS, MINN., OCT. 31 AND NOV. 1, 2 AND 3, 1899.—THE SESSIONS WERE HELD IN THE FIRST UNITARIAN CHURCH.

Abstract of Proceedings.

The first session was called to order by the president, HENRY MITCHELL, M. D., Secretary of the State Board of Health of New Jersey, Oct. 31, at 10 o'clock. About one hundred members were present and as many new ones elected.

The first subject taken up, after reading minutes of the preceding meeting and electing new members, was yellow fever. It was introduced by the Committee on the Etiology of Yellow Fever, by Dr. H. B. Horlbeck, chairman, Health Officer, Charleston, S. C.

Dr. HORLBECK referred, in considerable detail, to the recent report of Drs. EUGENE WASDIN and H. D. GEDDINGS, of the U. S. Marine Hospital Service, a commission appointed two years ago by authority of the President and the Secretary of the Treasury to investigate the nature of yellow fever in Havana, and quoted the conclusions of that Commission as follows:

"First. That the microorganism discovered by Prof. Giuseppe Sanarelli, of the University of Bologna, Italy, and by him named 'bacillus icteroides,' is the cause of yellow fever.

"Second. That yellow fever is naturally infectious to certain animals, the degree varying with the species; that in some rodents local infection is very quickly followed by blood infection; and that, while in dogs and rabbits there is no evidence of this subsequent invasion of the blood, monkeys react to the infection the same as man.

"Third. That infection takes place by way of the respiratory tract, the primary colonization in this tract giving rise to the earlier manifestations of the disease.

"Fourth. That in many cases of the disease, probably a majority, the primary infection or colonization in the lungs is followed by a 'secondary infection' or a secondary colonization of this organism in the blood of the patient. This secondary infection may be complicated by the coinstantaneous passage of other organisms into

the blood or this complication may arise during the last hours of life.

"Fifth. That there is no evidence to support the theory advanced by Prof. Sanarelli that this disease is primarily a septicæmia, inasmuch as cases do occur in which the bacillus icteroides cannot be found in the blood or organs in which it might be deposited therefrom.

"Sixth. That there exists no casual relationship between the bacillus 'X' of Sternberg and this highly infectious disease, and that the bacillus 'X' is frequently found in the intestinal content of normal animals and of man, as well as in the urine and the bronchial secretion.

"Seventh. That, so far as your Commission is aware, the bacillus icteroides has never been found in anybody other than one infected with yellow fever, and that whatever may be the cultural similarities between this and other microorganisms it is characterized by a specificity which is distinctive.

"Eighth. That the bacillus icteroides is very susceptible to the influences injurious to bacterial life, and that its ready control by the processes of disinfection, chemical and mechanical, is assured.

"Ninth. That the bacillus icteroides produces *in vitro,* as well as *in vita,* a toxin of the most marked potency, and that, from our present knowledge, there exists a reasonable possibility of the ultimate production of an anti-serum more potent than that of Prof. Sanarelli."

Considering the wide divergence of opinion which still exists with reference to the bacillus icteroides in its relation to yellow fever, the committee believed the organization of a commission of accomplished bacteriologists, fully equipped and provided with ample means, should be effected, which commission should be permanently located in one of the yellow-fever infected localities. Such remuneration should be provided as to command the highest talent in bacteriological knowledge.

Next followed:

(a) Description of Sanitary Stations about to be established in the Mexican Republic to Prevent the Spread of Yellow Fever and

(b) Eighth Report Presented to the Committee on Yellow Fever of the Cases Observed in the Mexican Republic, from the date of the last Report, Sept. 12, 1898, to Sept. 15, 1899, by Dr. Eduardo Liceaga, President Superior Board of Health of Mexico, Mexico City, Member of the Committee.

Dr. LICEAGA, a Detailed Description of the Proposed Sanitary Stations to be Established in the Mexican Republic to Prevent the Occurrence and Spread of the Fever, Emphasizing the Importance of Cleanliness and Disinfection.

Next were read:

Data for the Bacteriological Study of Yellow Fever, by Dr. ISMAEL PRIETO, Assistant Bacteriologist, Superior Board of Health of Mexico.

Necessity of Making a Complete and General Disinfection of a Vessel, in order to make it efficacious, proving partial disinfection is useless in cases of Yellow Fever, by Dr. NARCISO DEL RIO, Vera Cruz, Mex.

Yellow Fever a Preventable Disease, by Dr. ANTONIO MATIENZO, Tampico, Tamalipas.

Dr. DEL RIO laid particular emphasis on the importance of the thorough disinfection of vessels and pointed out the uselessness of partial disinfection.

In the discussion that followed the reading of this series of papers Dr. Thos. J. Turner, Medical Director, U. S. Navy (retired), fully agreed with the essayist in the importance of thorough disinfection and cleanliness and added his belief that the germs of yellow fever were carried by articles rather by persons.

It was pretty clearly shown by Dr. Matienzo's paper and the discussion that followed that yellow fever is preventable by sanitary methods. The experience of our Government in Cuba during the past year was cited as being distinctly corroborative of the position, for even with the limited sanitary work of our military authorities in Havana, Santiago and Matanzas, the activities of the fever have been very greatly minimized and the progress of sanitary engineering in those former pest holes, Havana and Santiago, will absolutely rid them of the annual visitation.

The relative freedom of our own country from any very severe epidemic of yellow fever since 1878 and 1879 was attributed to greater attention to quarantine restrictions. The papers on yellow fever took most of the time of the morning session, and, in order to get all of them before the association, it was necessary to vote an extension of time. There was not time for extended discussion, though some of the members, notably Dr. C. P. Wilkinson, New Orleans, and Dr. Frederick Montizambert, Ottawa, Ont., gave their experience in disinfecting vessels with formaldehyde, the former stating that in a total of 2,000 vessels disinfected only four

had afterward developed yellow fever, the latter testifying that he had found it equally efficacious.

The concluding papers of the morning session were by Dr. Juan Brenna, Zacatecaz, Mexico, on "The Influence of Forests on the Public Health," and a paper by Prof. John T. Smock, State Geologist of New Jersey, on "The Relations of Forests to the Public Health." The last-named paper was read by title only and will be printed in the published proceedings of the association.

Afternoon Session.

The first part of the afternoon programme was the address by Prof. W. H. WELCH, Johns Hopkins University, on "The Relation of the Laboratory to the Public Health."

The public laboratory, he said, was a purely modern creation, and was, in fact, the creation of this country. With the exception of anatomical laboratories, he said, there was no public laboratories before the present century. The first chemical laboratory was founded at Eaton in 1820 and a number of others were opened shortly afterward. The more recent laboratories are purely hygienic. The first hygienic laboratory was founded in Munich in 1878. All departments were represented and the great problems such as garbage, water supply, epidemics, etc., were taken up and studied and the cities had been inestimably helped. A great impulse came from the discoveries in bacteriology, and hygienic laboratories were rapidly organized all over Germany and all over the world. The epidemics have been beneficial to the human race, as they have brought before the people in a forceful way the needs of precaution and the value of public laboratories.

Laboratories connected with State boards of health, with colleges and especially with municipal boards of health have been springing up all over the country and are found to be of great assistance to physicians in diagnosing diseases. In these laboratories diphtheria is studied and the proper methods of administering anti-toxin are discovered by experiment. The diagnosis of tuberculosis and of typhoid and malarial fevers can be made with great exactness. Typhoid fever is preventable and if the laboratories were made more open to the general practitioners that disease would be discovered in the very earliest stages. Preventive measures should be taken at the first onset of the disease.

The laboratories have introduced more exacting and better methods in the boards of health and have caused younger and more

active men to become interested in the work, and in general the tone of the boards has been improved.

The meeting of the bacteriologists this year was a somewhat unusual occurrence, but Mr. Welch stated that he hoped that the meetings would be continued and that the laboratory committee or whatever it might be called should be considered a part of the association.

Prof. Welch was followed by a paper on "Educational Institutions in Relation to Expert and Commercial Work," by Mrs. ELLEN H. RICHARDS, Boston.

It was the little talk by Dr. Wyatt Johnston, bacteriologist to the Provincial Board of Health of Quebec, however, that called out the most discussion. Dr. Johnston gave some of his personal experiences in disinfecting. The burden of the discussion turned on the best means of disinfecting by means of formaldehyde gas; the proper temperature, moisture and the most efficient apparatus. The discussion was participated in by Dr. C. P. Wilkinson, New Orleans; Dr. A. Ravold, St. Louis; Dr. E. K. Sprague, U. S. Marine Hospital Corps; Dr. A. Gehrman, Chicago; Dr. J. N. Hurty, Indianapolis; Prof. F. C. Robinson, Brunswick, Me.; Dr. Frank Warner and Dr. E. G. Horton, Columbus; Dr. Crosby Gray, Pittsburg; Dr. E. G. Hill, Boston; Dr. H. B. Horlbeck, Charleston, S. C.; Dr. S. H. Durgin, Boston; Dr. F. F. Westbrook, Minneapolis, and others.

Evening Session—Welcome from City and State.

The church was comfortably filled and much interest was taken in the proceedings. The audience was made up of about equal numbers of delegates to the convention and residents of Minneapolis who are deeply interested in sanitary matters, prominent men and women being there in large numbers.

General attention was attracted to the Mexican delegates to the convention, who entered late and were escorted to eligible seats. Dr. R. O. Beard presided. He opened the proceedings by introducing Rev. H. M. Simmons, pastor of the church, who made a short prayer, in which he called upon the Divine Spirit to coöperate with the American Public Health Association in making better and purer the world.

Gov. Lind was to have extended the welcome to the delegates on behalf of the State, but at the last minute he was called out of the city, and so his place was taken by Dr. R. G. Smith, St. Paul.

who delivered a masterly address. In the course of his remarks he said he hoped the convention would pay particular attention to the Mississippi River water, over which there had been considerable discussion of late. In closing his address the doctor took a sly rap at the Christian Scientists, without specially mentioning them.

"There are too many persons," said the doctor, "who go to the Lord when they are ill, and the consequence is they are soon gathered in to their fathers and other persons are exposed to disease. If such persons would only go to the Lord and a physician at the same time they would stand a better chance of living and less contagion would be spread."

The doctor extended a particularly warm welcome to the delegates from Mexico and Canada, telling the latter that as the sad news came in of defeat of British arms in the Transvaal the Americans realized more than ever that the Englishman and the Canadians and the Americans were one.

Mayor JAMES GRAY, after telling the delegates how glad the city of Minneapolis was to see them, said he had always understood that bacteriologists were a remarkably bright lot of men, but he had now learned that this was a mistake. He attended the banquet to the bacteriologists at the Minneapolis club Monday evening, and not one of the speakers had remarked that in Germany the things the doctors studied were called germs, parasites in Paris, and microbes in Ireland.

The mayor, becoming serious, said as a public official he realized how hard it was for the doctors to guard the public health, and gave as an illustration the case of a Minneapolis woman, who, having been saved from the smallpox at the expense of the city, became angry and wanted to sue the municipality for the value of her clothing that had been destroyed upon the order of the board of health. Until there was a higher education on the part of the people, said the mayor, there is urgent need of such bodies as the American Public Health Association.

Dr. H. B. Sweetzer, president of the Hennepin County Medical Society, welcomed the delegates on behalf of the medical men of the city, and paid a high tribute to the work of the association.

President Cyrus Northrop, of the State University, made a few remarks of a humorous nature, and then came the annual address of Dr. HENRY MITCHELL, president of the Association:

A Review of Sanitary Progress.

He stated that public interest in all questions relating to the development of a working system for carrying into effect the rapidly unfolding truths of sanitary science had been one of the most prominent features of the period which had elapsed since the association was organized. During this period had occurred nearly all of the substantial improvements in municipal sanitary administration which at present stood engrafted upon our system of government. He referred in general terms to recent sanitary progress, and spoke more specifically concerning a few of the details relating to the prevention of disease, including sanitary legislation, education of sanitary officers, decrease of infant mortality, vaccination, typhoid fever, tuberculosis, adulteration of foods, and local, State, and national sanitary administration. During the twenty-seven years which had passed since the organization of the association, legislation designed to protect and promote the public health had been obtained in almost all of the States within the territory represented in the membership, and efforts were now being made to secure a greater degree of uniformity in these enactments, and in the methods to be pursued in their enforcement, at least so far as they were related to interstate questions. The hygienic control of milk supplies had assumed a better working basis in numerous localities, and the popular demand for clean milk was beginning to meet with response from a few of the more progressive dairymen. The history of the morbidity in the military camps of the United States during the recent war with Spain had demonstrated anew the truism that cleanliness of water and food was an indispensable condition to health, and typhoid fever by its prevalence in these camps had further justified its selection as a typical illustration of the value to the public health of a rigid application of the principles of hygiene. The reduction of the death rate in typhoid fever had been chiefly effected by the improved sanitary conditions in towns, and the relations formerly existing between urban and rural districts were now reversed, the proportion of cases of typhoid occurring in scantily populated regions being much larger than in towns. Further study of the methods by which the spread of tuberculosis may be restricted had also engaged much of the attention of local sanitary authorities during the past year, but no general agreement had yet been reached concerning the course to be pursued for the prevention of this disease. Conservative recommendations for checking the prevalence of tu-

berculosis included the inspection of all bovine animals, meat, dairy products, and dairy premises; the destruction of diseased animals, and the prohibition of the sale of diseased meat and milk; exclusion of diseased persons from markets, dairies, and other premises where food was prepared or sold; frequent and regular disinfection of public conveyances and places of public assembly; disinfection of all infected apartments after death or the removal of patients. Dr. Mitchell then dwelt upon the necessity for establishing in the United States a national department of public health, saying that its importance had been strengthened by recent events, the addition of tropical possessions having added new responsibilities to those already borne by the general government, requiring investigations concerning the distribution and character of preventable diseases occurring throughout the entire territory occupied by the nation.

Second Day—Morning Session.

CAUSE AND PREVENTION OF INFECTIOUS DISEASES.

Dr. PETER H. BRYCE, of Toronto, chairman, presented "Report of the Committee on the Cause and Prevention of Infectious Diseases."

He said that the past year had been fruitful in experimental work and discoveries in a field which, if not new, was one which had hitherto received but little attention. So early as 1870 Davaine attributed to flies an important part in the spread of anthrax from dead infected materials to living animals, and in the past five years positive experiments had added to the knowledge of the subject. It had been very well established that flies by sucking the blood of diseased persons could transmit disease. Localized epidemics of dysentery had been caused by flies carrying infection from fecal matter. The essayist referred to Simond's paper, which appeared in the *Annales de l'Institut Pasteur,* in which was reviewed the origin of the epidemics of the plague observed since 1898 in China and India, based on personal investigations in Tonkin and later in Bombay. In tracing its spread, abundant evidence was adduced to show that while man may be the occasional agent of the transmission of plague, he was only indirectly so; the author then pointed out the role played by rats as the principal source of its propagation. In general he stated that the epidemic of plague

was preceded by an epidemic swarming of rats, and he showed from many illustrations that the first persons attacked with plague lived in those quarters where grain was stored up and who were actually employed in granaries and storehouses, as along the quays; and he further illustrated how, through rats in the holds of ships, the disease was carried from port to port. It was pointed out further that the contagion from person to person in hospitals was wholly exceptional, and many physicians in plague hospitals refused to admit the contagiousness of plague.

Dr. Bryce quoted from the marvellous series of reports by Dr. John Simon, the greatest of all sanitarians, who said, in 1874, in the prevention of disease we must "remove the cause of uncleanliness," that was, "remove filth." This eminent sanitarian then illustrated the varieties and degrees of filth as (*a*) putrescent refuse matter, solid and fluid, causing effluvia and pollution by soil soakage; (*b*) overcrowding, thus polluting the two sources of public health, air and water. Dr. Bryce concluded by saying (1) thus we might, as regards typhoid fever, arrange works for disposal of the garbage and sewage of houses, towns, camps, so as to make local accumulations of organic vegetable and animal pollution impossible, in which the typhoid germs might grow, and from which they might be carried to food and drink. (2) By drainage soil pollution by either vegetable or organic matters would be prevented, so that mosquitoes could not breed in the vicinity of habitations and so be in a position to become disseminators of the malarial parasite; and if they were present, houses should be protected against them, especially at night. (3) Houses should be so constructed as to render them not very accessible to rats, and such a condition of cleanliness of rooms, clothing, and persons should be maintained in these that infected matter would not be present, or, if it was introduced, there would not be flies to carry it. (4) As regards ships, the very means which were now in practical operation at well-equipped quarantine stations would amply serve to destroy rats, *i. e.*, sulphur and formol. (5) Passengers should be detained longer than is necessary for the disinfection of a ship and the elapse of the period of incubation of five days for plague, to which, in the presence of actual infection, might be added a protective inoculation.

Dr. FRANK W. WRIGHT, health officer of New Haven, Conn., read a paper on "Prevention of Contagious Diseases." To prevent the spread of contagious diseases, two objects must be ac-

complished: First, the destruction by disinfection of the poison given out from the sick person, and, second, the prevention of any poison that had escaped disinfection, from coming in contact with susceptible persons—isolation. Certain diseases might be limited by rendering persons immune to inoculation, as in smallpox or diphtheria, it being now practicably impossible for the former of these diseases to obtain a firm foothold in any well-vaccinated community. A good hospital for the accommodation of persons affected with contagious diseases should be maintained in every State. The writer found a short time ago, by inquiry, that of sixty-two principal cities in the United States and Canada, less than one-quarter were provided with decent hospitals for contagious diseases, some not even having a place for the care of smallpox patients. He believed many lives were sacrificed by contagious diseases annually that could be saved if all persons would conscientiously give attention to details and lend support both morally and financially.

Dr. J. E. MONJARAS, of San Luis Potosi, Mexico, dwelt upon transmissible diseases in that city, and made some general remarks on their etiology and prevention.

In the discussion, Dr. CHARLES A. LINDSLEY, secretary of the State Board of Health of Connecticut, made the point that the work of enforcing health laws was much facilitated by placing the authority for prosecution directly in the hands of an attorney, rather than leaving it with a doctor, who knew nothing about law. He had found that this plan added much to the effectiveness of work in his State. Reports of infectious and contagious diseases had much improved there of late both in accuracy and promptitude.

Dr. CHARLES V. CHAPIN, of Providence, R. I., made an argument for thorough teaching of modern scientific hygiene in universities and medical schools.

Dr. WYATT JOHNSTON, of Montreal, said that the great trouble was that the time at the disposal of the professors in the schools was so limited as to prevent the introduction of adequate courses. He suggested that diploma courses in hygiene in the universities should be introduced, and advised the appointment of a committee to further his proposition.

Dr. CHARLES O. PROBST, of Columbus, Ohio, related his experience along this line at the University of Ohio, where an attempt was made to hold a hygienic course, but which was defeated by

the entire lack of interest upon the part of the class from which the students would be drawn.

Dr. BENJAMIN LEE, of Philadelphia, advocated the more general teaching of hygiene in colleges and universities.

School Inspection in Boston.

Dr. SAMUEL H. DURGIN, health officer, spoke on the system of school inspection in Boston. The schools were visited daily by physicians who examined any suspicious cases. These physicians were also charged with the duty of seeing that all cases of infectious diseases were properly isolated.

Dr. JOHN N. HURTY, secretary of State Board of Health of Indiana, said that the jealousy of business men was an important factor in enforcing health laws, and he gave an account of a recent epidemic of smallpox in Valparaiso, Ind., which was reported as chicken-pox by the physicians in that city, supposedly because merchants said it would hurt business. The foolishness of such a course was pointed out. The Indiana State Board of Health purposed to require a certain standard of knowledge in its health officers.

The Cause and Prevention of Infant Mortality.

Dr. ERNEST WENDE, health commissioner of Buffalo, presented a report on the cause and prevention of infant mortality. He paid particular attention to the subject of milk industry, which he said should be under both State and municipal control, operating in harmony under similar principles with the identical object in view, both acting together, forming a system of protection from dairy to consumer. The State should exercise its functions and control until the milk passed within the municipal limits and authority, and the control should include every feature and detail of protective sanitation. These features included briefly: (1) The license system, with fee, periodic systematic inspections with revoking power and penalties for dereliction. (2) The inspection system should include inspection of herds (tuberculin tests), food, animal care. (3) Demand for sanitary environment and buildings, correction of existing evils and examination and approval of plans, pending erection of new ones, which should comply with a standard of sanitary construction with special reference to specific

requirements of the business—viz., separate milking and stabling quarters, proper cubic air space, non-absorbent material. (4) Scrutiny of water supply, standard feeding, health of employees, hygienic care of utensils and cans, cleanliness and protection in milking. (5) Definite rules governing all procedures, particularly as to the cooling process, preparation for market, and in relation to the varying seasons. (6) The differentiation of the various characters of milk by differently colored or shaped cans, which should be properly labeled with date of milking and time of shipment. (7) Prohibition of milk preservatives and coloring agents, or adulteration, and of the marketing of milk from diseased, sick, or parturient cows, or of the use of disinfectants, their necessity implying bad sanitation. (8) The prohibition, particularly, of refuse or swill food upon any dairy premises, of any food considered unhealthful by reason of decomposition or fermentation, and of the association of other domesticated or housing animals with cows. (9) A standard of quality, with periodic testing and analysis. (10) Veterinary inspection with destruction and compensation within the State, and quarantine against the introduction of tuberculous cattle from without. (11) This should be as rigid as against pestilence in man, and it was only by this means that the malady could be circumscribed, and its bearing on human life favorably influenced. (12) With this standard of supervision by the State, the municipality should continue the supervision upon the same lines, which might be outlined as follows: (*a*) Continuation of the license system with penalties, together with stringent ordinances covering quality, adulteration, sanitary care, and relation to contagious disease contamination; (*b*) milk should comply with the State standard as determined by lactometer tests, periodically instituted, as ascertained both in milk houses and on wagons; (*c*) sanitary non-absorbent milk-rooms, of determined size, air space, ventilation, and light; (*d*) specifically constructed, indirectly plumbed cooling and storage boxes, non-communicating with sleeping-rooms, privies, stables, or other influencing rooms; (*e*) wagons properly lettered and numbered, with protection from summer heat; (*f*) stringent prohibition regarding intercourse with houses containing contagious diseases, particularly relating to the exchange of milk bottles and the prohibition of refilling jars *en route;* (*g*)the constant surveillance of contagious disease in relation to milk routes by means of the "tell-tale" register; (*h*) obligatory cleansing of milk utensils by a uniform method, and of

cans before returning to the dairy; (*i*) special supervision of and discouragement, if not abolishment, of selling in grocery stores, and milk sellers of similar character, where the business was subordinate to other interests, and there was consequent lack of protective facilities; (*j*) until State and city act in unison in this, where their interests were identical, the adoption of arbitrary interdiction or destruction at the city line of all milk coming from dairies whose conditions, or herds, might have a deleterious influence upon the milk; (*k*) systematic system of reports, with mutual warnings and notification of imperilling conditions.

Formaldehyde as a Milk Preservative.

Dr. A. G. YOUNG, secretary of State Board of Health of Maine, contributed a paper on this subject. He said that the results of his examinations of all the available printed and other reports regarding the action of formaldehyde seemed to justify the following conclusions: (1) That used as a preservative, it tended at least to impair the nutritive value of milk. (2) Its tendency was also to interfere with the digestive processes. In either case it was only a question of dosage, and the limit of safety was difficult to determine. (3) That though the inhalation of formaldehyde gas was much less dangerous than the breathing of the other gaseous agents much used as disinfectants, the results of tests upon animals, and of one case of accidental poisoning of a human being, indicated that formaldehyde taken into the digestive system might produce dangerous and even fatal results. (4) It would be unwise and unsafe to encourage or to suffer the use of formaldehyde in the public milk supply, even under any possible restrictive regulations. (5) In every State, as is now the case in many, there should be a law prohibiting with effective penalties the use in milk of any chemical preservative whatsoever.

Typhoid Fever.

At the afternoon session Dr. JOHN L. LEAL, Health Officer of Paterson, N. J., described an epidemic of typhoid fever in that city which was traceable to an infected public water supply.

Dr. H. C. H. HEROLD, of Newark, N. J., spoke of the great decline in the mortality rate of typhoid fever there since the improved water supply of that city was introduced.

Dr. GARDNER T. SWARTS, of Providence, R. I., made a favorable report of a four months' test of a mechanical filter plant at East Providence.

Mr. H. W. CLARK, of Boston, dealt with the bacterial purification of sewage.

Dr. CHARLES V. CHAPIN, of Providence, presented the report of a committee to examine into the existing sanitary municipal organizations of the country which belonged to the association, with a view to report upon those that are most successful in practical results.

The session closed with a paper by Mr. W. H. ALLEN, of Philadelphia, on rural sanitation in England.

Thursday—Morning Session.

There was a great excess of papers on the programme—several that already had been passed over—insomuch that many were read by title only, and but little time for discussion.

A RESOLUTION was offered and adopted that steps be taken to secure advanced teaching and the giving of diplomas in hygiene, and that recognition of such diplomas be made by sanitary authorities.

Another resolution was adopted recommending to all governments to set apart such portions of their forests as may be practicable for national parks.

A SECTION was created, to be known as the Bacteriological and Chemical Section of the American Public Health Association. Dr. THEOBALD SMITH, of Boston, was chosen for the chairmanship of the new Section. This Section is to meet on the day preceding the meeting of the general association.

VACCINATION.—Dr. WILLIAM BAILEY, of Kentucky, who had prepared a paper on the subject, narrated in an interesting and instructive manner some points pertaining to the history of vaccination.

Dr. W. C. WOODWARD, Health Officer of Washington, D. C., spoke of the accidents of vaccination, some of which arose from impure virus, lack of aseptic precautions, etc.

Dr. E. LICEAGA contended that revaccination was really unnecessary in Mexico, while in Europe it was imperative because animal virus was used. In Mexico humanized virus was used. His remarks were based on two hundred thousand vaccinations in the Republic of Mexico.

Dr. CABANA referred to an epidemic of smallpox which occurred in Montreal in 1885, in which there were ten thousand cases. He

thought sterilized virus from the animal was preferable to the humanized virus. He referred to syphilis and other diseases being transmitted by using humanized virus.

Dr. WRIGHT, of Minneapolis, related his experience during six years' residence on the western coast of the Mediterranean Sea. Humanized virus was used there in vaccinating, and he knew of no case of syphilis or any other disease being communicated from one person to another by this method of vaccination.

Dr. SAMUEL ABBOTT referred to the rarity of cowpox, and believed that infection in most instances was transmitted by individuals rather than by cows. Very little was known about the remote origin of the infectious diseases.

Dr. WILLIAM H. WELCH referred to the septic infections that occurred at the time of or following vaccination.

Dr. PETER H. BRYCE asked in regard to hypodermic injections of vaccina, to which Dr. W. C. Woodward replied that Dr. Kinyoun had tried it in numerous cases with satisfactory results.

Dr. CHARLES V. CHAPIN called attention to a report of the New York Board of Health for 1896, in which reference was made to experiments with the subcutaneous inoculation of vaccina, saying it was not so reliable as inoculation by scarification.

Dr. SAMUEL H. DURGIN reported a case in which subcutaneous injection of vaccina was resorted to, the constitutional disturbance being the same as that observed by the usual method of vaccination. This case was observed some twenty or more years ago.

Dr. FREDERICK MONTIZAMBERT favored bovine instead of humanized virus, principally for the reason that if syphilis or any other disease should follow vaccination by humanized virus the anti-vaccinationists would have an argument for the condemnation of vaccination generally.

Dr. CHARLES F. ROBERTS, Sanitary Superintendent of New York City, also spoke in favor of bovine virus for vaccinating purposes.

Dr. BENJAMIN LEE narrated an instance in which several members of one family were infected with syphilis by impure virus, the vaccination having been performed in this case by a drummer, not a doctor.

Dr. JAMES F. KENNEDY, Secretary of State Board of Health of Iowa, said the president of the Anti-Vaccination League lived in his State, and it was claimed by the anti-vaccinationists that not

only syphilis but tuberculosis was transmitted by bovine inoculation; but he did not think so.

Dr. LOUIS LABERGE, of Montreal, said that with humanized lymph, if proper aseptic precautions were observed, there was practically no danger of transmitting disease.

Dr. LISTON H. MONTGOMERY, of Chicago, asked in regard to tetanus following vaccination and if pathogenic germs were found in the discharges.

Dr. CABANA reported two cases of tetanus following vaccination.

Dr. WOODWARD reported another case.

Dr. H. M. BRACKEN said that physicians should take cognizance of the length of time following infection. In two cases of tetanus which he had observed the disease developed on an average of three weeks after vaccination. These persons were very dirty, and he believed the vaccination had nothing to do with the development of that disease.

THE OFFICIAL DEFINITION OF DIPHTHERIA.—Dr. H. W. HILL, of Boston, read a paper on this subject. He said that the first factor in the production of the disease was the patient and the second the bacillus of diphtheria. The disease of diphtheria was existent only when the active diphtheria bacillus, producing recognizable lesions, was present. The presence of diphtheria bacilli without the production by them of recognizable lesions did not constitute this disease; nevertheless such patients might be a source of possible infection to others. The necessity of isolating persons suffering from the disease, in order to prevent its spread, had long been recognized. In order to place the matter on a definite basis it was suggested that this definition be recognized by so wording all regulations relating to the supervision of diphtheria that, in so far as might be advisable for the protection of the public health, the demonstration of the presence of the diphtheria bacillus should be sufficient to empower health authorities to proceed with measures directed to prevent its dissemination. He suggested that such phrases occurring in regulations as "persons suffering from diphtheria," or "cases reported as diphtheria," should be modified to read "persons suffering from diphtheria or infected with diphtheria bacilli," and "cases reported as diphtheria or as infected with diphtheria bacilli." It seemed to him that a simple change of wording would give the necessary power to health authorities, while absolving them from any charge of wrenching terms to suit

misunderstood conditions, such as were sometimes, although unjustly, brought forward.

STATE CANCER LABORATORY.—Dr. A. WALTER SUITER, of Herkimer, N. Y., offered the following resolution, which was adopted:

Whereas, The State of New York has taken a decisive step in advance by the grant of an annual appropriation for the establishment and maintenance of a laboratory with all modern appliances for the persistent prosecution of studies in the etiology of cancer; and whereas results have already been obtained which lead to the hope that the discovery of the etiological factor in the production of this much-dreaded disease may be attained; therefore, be it

Resolved, That the association approve of similar efforts to that end, that State and national patronage in special and general scientific research may be universally established.

A NATIONAL HOME FOR LEPERS.—Dr. H. M. BRACKEN, Secretary of the State Board of Health of Minnesota, presented the report of the committee on a national home for lepers in the United States. He stated that inasmuch as the Congress of the United States had passed a law for the appointment of a commission of medical officers of the Marine Hospital Service to investigate the origin and prevalence of leprosy in the United States and to report upon what legislation was necessary for the prevention of the spread of the disease, he would recommend that the committee of the association be continued to report at the next meeting. He stated that the Ramsey County Medical Society and the Minnesota Academy of Medicine had already taken action urging upon the United Staes Government the necessity of establishing homes or colonies where lepers could be segregated, thus protecting the general public and at the same time furnishing these sufferers with a comfortable home and suitable medical care.

DEFINITION OF AN EPIDEMIC.—Dr. U. O. B. WINGATE, Secretary of the State Board of Health of Wisconsin, presented the report of the committee to define what constitutes an epidemic, and the following definition was recommended to the association for adoption: "An epidemic is an outbreak of a communicable disease or infectious disease, affecting a dozen or more individuals in quick succession before the recovery of the first case, whether arising from a single focus or from several foci in the neighborhood." This definition was not satisfactory to the association, and the matter was therefore referred to another committee to be appointed for the ensuing year.

Fourth Day.

THE TREATMENT OF GARBAGE AND EXCRETA IN MILITARY CAMPS.—Dr. BENJAMIN LEE, of Philadelphia, presented a paper on this subject. He spoke of flies as factors in the causation of disease. He also referred to the portable furnaces which were now being used by the United States Government at Havana for the destruction of garbage, with gratifying results. "Waste Disposal and Its Advances," by Mr. MACDONOUGH, C. E. CRAVENS, New York City, N. Y.; and "The Next Step in Waste Disposal Works," by Col. W. F. MORSE, S. E., New York City, N. Y., were read by title and referred for publication in the Transactions. The latter appears in full on other pages in this number.

DIPHTHERIA ANTITOXIN.—Dr. C. H. JONES, Health Commissioner of Baltimore, related his experience in the treatment of diphtheria with antitoxin and formaldehyde, which showed a great decrease in mortality by the use of these agents. He said that the health department of that city had not lost a case of diphtheria which was treated with antitoxin within the first two days of the disease.

REPORT OF THE COMMITTEE ON DEMOGRAPHY AND STATISTICS IN THEIR SANITARY RELATIONS.—Dr. C. L. WILBUR, of Lansing, Mich., stated that with the completion of the work relative to the nomenclature of causes of death, a larger part of the time of the association should be devoted to other subjects of vital statistics, which had been neglected to some extent in recent meetings. Technical papers, dealing with the best methods of collection, tabulation and presentation of vital statistics, should be presented, but papers of a different class, relating to the employment of vital statistics in practical sanitary administration, should also receive consideration. Some systematic effort should be made to extend the number of registration States, and to insure that all States and cities adopting methods of registration should comply with certain necessary standards of efficiency, which it might well be the province of the authorities connected with the association to formulate for convenient reference. Lastly, no efforts should be spared to raise the general standards of vital statistics and to increase their value in the public mind as an absolutely essential part of modern sanitary science and the basis of public health work. Vital statistics should be systematically taught in our medical schools, with special reference to their practical use by health officers and stu-

dents of the prevalence of disease. The practical study of mortality statistics was a necessary part of the work of the medical officer of health, and its reputation and character should not be diminished by withdrawing it in any case from medical direction.

OFFICERS ELECTED.—The following officers were elected for the ensuing year: *President,* Dr. Peter H. Bryce, of Toronto, Ont.; *First Vice-President,* Dr. H. M. Bracken, of Minneapolis, Minn.; *Second Vice-President,* Dr. Juan Brena, of Zacatecas, Mexico; *Secretary,* Dr. Charles O. Probst, of Columbus, Ohio; *Treasurer,* Dr. Henry D. Holton, of Brattleboro, Vt.

Indianapolis, Ind., was selected as the place for holding the next meeting.

ENTERTAINMENTS.

Besides the pleasure of a profitable meeting in the interest of preventive medicine, there were many delightful entertainments at recess.

The wives of the delegates and other ladies in relation with the association were handsomely entertained by Mrs. M. H. Bracken on the first day and Mrs. H. H. Kimball on the second. Many ladies were present on both occasions.

An enjoyable "smoker" was given by the Minnesota Academy of Medicine and an evening reception by the citizens of Minneapolis. Delightful drives roundabout and special trolley rides to interesting places were daily features.

SANITARY MATTERS IN JAPAN.—The "Allg. Wiener Med. Ztg." states that in Japan the Bureau of Public Health is connected with the Internal Department. The country is divided into seven sanitary districts and each community has a sanitary council consisting of police officers and two local members of the profession, druggists or veterinarians, who confer with the local officials in all matters affecting the public physical welfare. There are three government experimental laboratories, open to private individuals for a small remuneration, and botanical gardens, serum institute, etc., and a grand central advisory board consisting of leading officials in the army, navy, universities and cabinet, with twenty experts from the profession, pharmacists or veterinarians.

MEDICAL EXCERPT.

By T. P. Corbally, A. M., M. D.

Hydrogen Dioxide in Surgery.—M. Tissot ("Archives de Médecine Navale," 1899) advocates peroxide of hydrogen as an energetic antiseptic and easy of employment. Its use is becoming more and more extensive in surgery and also in medicine.

In medicine we may recall the results described by Biard in his thesis, published in 1896, in which he refers to the successful use of the peroxide of hydrogen in uncontrolable vomiting. In surgery its use is more varied and its applications more extensive. Since 1862 Langier, J. Guérin and others have pointed out its use as an excitant in certain cases. Bailey in 1881 recommended it and it was used by Pean and Béchamp to counteract putrid action. P. Bert and Regnard, at the Académie des Sciences; Nocart and Mallereau, at the Académie de Médecine, had praised the excellent qualities of this agent, which was perfectly harmless, as was proved by the experiments of Laborde and Quinquand. Lermoyer, in 1896, made a report of the use of peroxide of hydrogen in the clinics for rheinology in Vienna, and Gellé, following his example, advised its use in otology.

Lucas-Championmére uses it constantly in his practice, and on the 6th of December, 1898, made an interesting communication on the subject to the Académie de Médecine. He uses it constantly in general surgery, in cureting bones attacked with osteomyletis, in the removal of tumors, and he thinks he is justified in forming the following conclusions:

First. He has never had the least trouble arise from the use of this antiseptic, nor any local irritation, nor erythema, nor have any toxic symptoms been observed in the course of his practice.

Second. As application is almost painless, it causes a slight heating of the surface, which is easily tolerated.

Third. It causes an abundant discharge of gas in the form of a fine frothy substance, sometimes tinged with blood, which exudes from the surface of the sore when the foreign substances have been removed by the decomposition caused by the action of the dioxide, or it forms a swelling outside of cavities when the wound is closed and deep, caused by the distension of the gas. This may

be painful if the surrounding parts are tender and painful and the gas does not escape freely.

Fourth. It gives a healthy appearance to wounds and seems to favor the act of repair. It should not be continued after all diseased substances have been removed, for it causes too much irritation.

Fifth. Apart from its evident antiseptic action, it is also hemostatic and deodorizing.

We have ourselves used it in our daily practice, and used it frequently, either in cases of minor surgery or in dressing suppurating wounds as varicose ulcers, anthrax, etc., and our observations have all contributed to the support of the conclusions of M. Tissot.

METHYLENE BLUE.—M. Boinet, Professeur á 'IEcole de Médecine de Marseille, has a note in the "Bulletin de Therapeutique" (Aug. 15, 1899) on the therapeutic value of Bleu de Méthyléne dans l'impaludisme.

The author, with Dr. Trintignan, after numerous trials made in 1892, arrived at the following conclusions: The treatment of impaludism, or marsh fever, with the methylene blue in cases in which sulphate of quinine had proved unsuccessful, gave very satisfactory results when the attack was of recent occurrence. M. Boinet has since continued his experiments on the workmen employed as scavengers in the Camargue. He has divided the cases into three classes: First, recent cases of paludism in which quinine had never been given; second, cases in which methylene had failed and quinine produced better results; third, chronic cases.

M. Boinet has concluded that in acute impaludism the preference should be given to quinine, which, however, may be replaced with or combined with methylene. If quinine fails it is generally because it has not been given in sufficient doses or been administered under unfavorable conditions. In chronic impaludism and in chronic marsh fever, attended with cachectic symptoms, the methylene is much less active than in acute cases.

M. Boinet concludes, therefore, that methylene blue has a decided therapeutic action in impaludism, but it is inferior to quinine. Still, far from excluding it from use, these two agents may be associated either successively or administered in combination or separately in a given case.

ICHTHYOL IN SCIATICA.—Dr. Croq, in a late number of the

"Journal de Néuralgie," speaking of the treatment of sciatica with ichthyol, says: Ichthyol, the complex product of the distillation of a bituminous rock found in the Tyrol, is an antiseptic extensively used, which, when administered internally, gives excellent results in the treatment of asthma, of neuralgias and of rheumatism. M. Croq has used it with remarkable success in rebellious cases of sciatica. In twenty cases fourteen were successfully cured. He prescribed daily six to eight pieces or capsules containing 0. gr. 10 cent. of ichthyol, and he recommends, besides, friction five or six times in twenty-four hours with the following liniment:

Ichthyol.	50 grammes
Glycerine.	20 grammes
Distilled water.	30 grammes

This is a new treatment to be employed in rebellious cases of sciatica, which so often discourages the sufferer and exhausts the patience of the physician.

EUPHORIC MEDICATION.—M. Ferrand has sent to the Association Française pour l'Avancement des Sciences ("La France Medicale," Sept. 29) a note relative to the administration of morphine in cases of syncopy, of asphyxia, and, in general, in cases of collapse or of impending death. The note is in accord with a formula which he gave in a communication on the subject to the Academy of Medicine. To avoid the danger of collapse or of syncopy and also of asphyxia, it will suffice to add to the solution of morphine an agent capable of rapid and certain stimulation, a result which is certainly obtained from the use of euphoria.

Among the stimulating agents ether is the most reliable for the production of such a result, but a euphoric effect may be obtained by employing another class of agents. These are the excitant antispasmodics, the quieting antispasmodics and even the contra-stimulants. These agents possess the quality of at the same time and in varying degrees modifying the functional activity, while they do not disturb nor even stimulate the organs of nutrition.

This quality is best obtained from the combination of morphine with ether. In this way we can intervene in many serious cases with great benefit and without the risk of producing any ill effects.

HERNIAL TUBERCULOSIS.—M. Ch. Faguet, of Perigneux, stated to the Association Française pour l'Avancement des Sciences ("La

France Médicale," Sept. 29) that the recognition of hernial tuberculosis is of a quite recent date. It was observed and described by Cruveilhier in 1862. M. Lejars, in 1889, in his work on hernial neoplasms and perihernia, describes seven cases. M. Jonesco has collected eleven cases, which he has described in an interesting monograph in the "Revue de Chirurgie," in 1891. Other cases have been published in the reports of MM. Th. Renard, of Bordeaux, in 1891, and C. Nurdin, Paris, 1897.

The subject of M. Ch. Faguet's case was a young man eighteen years of age, a farmer, who had previously no pathological symptoms whatever. When lifting a very heavy plough the young man felt a sharp pain in the left inguinal region and observed there a small hernial protrusion which became the seat of frequent attacks of colic. Seven months after the appearance of the hernia on examining the left inguino-scrotal region (1st), the testicle and the epididymis were found to be healthy; (2) a hard layer of plaque, which seemed to be seated at the base of the sack, was discovered; (3d) and also an enterocele, which was reducible. The other organs were normal, the general condition was excellent. The cure of the hernia was perfect. The intestine seemed healthy; there was nothing abnormal on the internal surface of the sack. The results following the operation were satisfactory. The bottom of the sack was entirely filled with a firm layer, or plaque, about the size of a two-franc piece and in thickness about five millimeters. Its character and consistence were uniformly fibrous, without irregularities or nodasities. The microscopical examination showed, in the bottom of the sack, strong evidence of tubercular lesions. In fact the tubercular cells were in great numbers throughout the entire serous membrane. The walls and the neck of the sack showed nothing abnormal.

Six months later this young man re-entered the hospital with evident symptoms of peritoneal and pulmonary tuberculosis, from which he died. The autopsy verified the correctness of the first diagnosis. In fine, it was a case of primitive tuberculosis, circumscribed at the bottom of the hernial sack; a tuberculosis which rapidly became generalized, notwithstanding that the operation seemed to anticipate its further extension.

THE TRUE VALUE OF GARGLING.—By gargling in the usual way (Charlotte "Medical Journal") only the upper anterior surface of the uvula and soft palate and base of the tongue are reached. The

method of holding the nose and throwing the head well back when gargling enables the fluid to reach every surface of the pharynx.

The value of the two methods can readily be tested by painting the posterior wall of the pharynx with a strong solution of methylene blue. After gargling with water in the usual way the latter will be perfectly clear and unstained. Then let the patient gargle again by the method suggested, and the injected fluid will be found stained.

THE TREATMENT OF INSOMNIA.—Impairment of the normal ability to sleep (New York "Medical Journal," Oct. 28), often amounting to protracted and exhausting insomnia, not only gives rise to much distress, but also undoubtedly aggravates the trouble on which it generally depends—neurasthenia. Wunderlich ("Sammlung klinischer Vorträge," No. 239; "Fortschritte der Medicin," Sept. 20) thinks that two-thirds of all cases of nervous insomnia are due to neurasthenia. In its treatment, he properly insists, hypnotic drugs should be avoided as far as possible. He thinks trional and sulphonal are the best of them. Under no circumstances should the use of morphine be allowed. If drugs are to be used at all it is generally best to prescribe the bromides in diminishing doses, beginning with forty-five grains at bedtime. If, however, there are phenomena of sensory irritation, perhaps antipyrine, lactophenine or phenacetine may also be indicated. That form in which the sleep is broken often depends on excessive gastric secretion and acidity of the gastric juice. For this sodium bicarbonate and bismuth may be given. But the measures most generally appropriate are hygienic and dietetic. In particular the cold pack is highly effective. It must not be so prolonged as to bring on sweating, but should be terminated when the patient begins to feel warm and the pulse increases in frequency.

BLINDNESS IN FINLAND.—The different degrees to which blindness prevails among various populations is always a matter worthy of study. J. Widmark has investigated the subject as regards Denmark, Sweden, Norway and Finland ("Nordiskt medicinskt Arkiv." August; New York "Medical Journal," Oct. 28). He finds that for every 10,000 inhabitants there are 5.3 blind persons in Denmark, 8.3 in Sweden, 12.8 in Norway and 15.5 in Finland. The preponderance in Finland, which is not observed among children under ten years of age, is attributed to the great prevalence of trachoma. Curiously enough, the "endemic" affects only the natives.

EDITOR'S TABLE.

SANITARIAN, DECEMBER, 1899.

☞All correspondence and exchanges, and all publications for review, should be addressed to the Editor, Dr. A. N. Bell, 337 Clinton Street, Brooklyn, N. Y.

PROGRESS IN MILITARY SANITATION.

Under a recent circular, Department of California, a commissioned medical officer is to be detailed in orders to act as medical inspector of the regimental and recruit camps on the Presidio Reservation, with authority to exercise general supervision over the medical and sanitary conditions in these camps, *and to see that the provisions of this order are properly executed.* This circular marks a most important step in the progress of military sanitation, as it clothes the sanitary inspector with actual authority in his own department, places upon him the responsibility for the existence of unsanitary conditions and elevates him from the anomalous condition of mere medical adviser, without powers to accomplish the changes which may appear to him to be advisable. The action above noted will undoubtedly arouse the hostility of line officers, since even the colonel of a regiment may, under its provisions, become subordinate to the sanitary inspector of lesser rank. Hence it is to be hoped that the medical officer selected to fill the latter position will, in addition to his excellent professional qualifications, possess that rare tact and moderation, combined with firmness, which will alone prevent undue opposition to the execution of this order. The system itself is on trial and a sanitary inspector of ill-balanced personality may do much to set back the progress of military hygiene for the immediate future.

The lack of executive authority has been a cause for bitter complaint on the part of sanitary officers, and, with indifferent or unfriendly commanding officers, has done much to destroy interest and ambition and to render inspection a purely perfunctory performance. The order above noted places an undivided responsibility upon the sanitary officer and officially recognizes the value of his important duties. We feel that the Army Medical Department and the medical profession at large are entitled to congratulations for this hard-won victory.

MILITARY SANITATION IN PUERTO RICO.

General Order No. 151, dated San Juan, Puerto Rico, September 27, 1899, makes a distinct advance in military sanitation, and, as remarked by the Boston "Medical and Surgical Journal," contains many provisions which might with advantage be adopted in our own supposedly more enlightened communities.

The value of the requirements noted below concerning the maintenance of proper cleanliness in all stores where food is offered for sale will be at once appreciated by all persons familiar with the conditions obtaining in Spanish-American countries. Milk is probably not adulterated to any great extent, and even in towns as large as Ponce the cows are driven to the residence of the customer and then milked. It is said, however, that in the past an occasional clever rascal has been known to secrete in his sleeve a conveniently shaped rubber bulb containing water, and thus dilute the milk during the operation of milking, undetected except by the closest scrutiny. The requirement that all secret or proprietary preparations must bear upon each bottle the exact formula used in their manufacture will be a severe blow to the patent medicine manufacturers of the United States, who have hitherto held a lucrative trade in Puerto Rico, and will undoubtedly excite their active hostility. As in this country, pharmacists in Puerto Rico are universally prescribers, and as they are largely men of no great education, it is with probable detriment to the general health. The provisions of the order are as follows:

(1) Foods and drinks in the meaning of this order are all articles used for food or drink by man, whether simple or compound. The term "drug" includes all medicines used by man, whether for internal or external use.

(2) No adulterated article of food or drink shall be made or sold in Puerto Rico; articles ordinarily recognized as food, which are really mixtures, may be sold if marked with the word "mixture" or "compound." No diseased, decomposed, offensive or unclean article shall be used in the manufacture of any food, drink or medicine.

(3) No person shall sell in Puerto Rico any impure, diseased, decayed or unwholesome provisions, or any adulterated bread, or any food substance mixed with poisonous substance.

(4) No person, whether owner, manager, keeper or agent, bartender or clerk, in any saloon, restaurant, boarding or eating house in Puerto Rico, shall offer for sale any food or drink containing anything poisonous or unwholesome.

(5) No person owning, renting or leasing any stall, room or stand where milk, meat, vegetables or groceries are sold as food shall fail to keep said room, stall or stand in a cleanly condition, nor shall such persons allow such milk, meats, vegetables or groceries to become poisonous or infected or unfit for food by reason of uncleanly condition of such stall, room or stand.

(6) No person shall offer for sale in Puerto Rico any unwholesome, watered or adulterated milk or milk produced from cows which are visibly diseased, or are kept upon and fed on garbage, swill or other deleterious substance.

(7) No person shall sell any article of food or drug which is not of the nature, substance and quality of the substance demanded by any purchaser. And no person shall sell any compound food or drug which is not composed of ingredients in accordance with the demand of the purchaser.

(8) No person in Puerto Rico shall subtract from any article of food any part of it, so as to affect injuriously its quality, substance or nature; and no person shall sell any article so altered without making disclosure of the alteration.

(9) All drugs sold must be of the standard quality and strength prescribed in the Spanish or United States pharmacopeias.

(10) All compound, proprietary, patent or secret remedies sold in Puerto Rico shall bear upon the bottle, box or package an exact formula, stating the constituents of the medicine or remedy.

(11) No pharmacist not a legally qualified physician shall prescribe remedies for the sick. Every bottle, box or package containing any medicine or drug shall be labeled with the name of the same and with the name of the physician who wrote the prescription. Pharmacists shall not sell arsenic or strychnine, or their compounds, or other drugs commonly known as deadly poisons, except upon the prescription of legally qualified physicians. Before such sale is made the name of the drug and the quantity, the name of the physician prescribing, and also the name of the purchaser, shall be entered in a book especially kept for this purpose. The purchaser shall sign his name in a book below the entry made by the druggist. Every bottle, box or package containing a dangerous drug shall be distinctly labeled "Poison," and the person shall be warned of the nature of the article.

THE PATIENT STOMACH.

"The rush of modern civilization ('Medical Press and Circu-

lar') leaves little time for the average man to think of anything outside the immediate tether of his own absorbing pursuits. He is content to eat, drink, sleep and take his pleasures as they come, without encroaching upon the period of his scant recreations by such solid labor as that involved in consecutive thinking. In this way eating and drinking are regarded much as breathing or the complex nervous and muscular acts that take place in walking or talking; all are accepted as matters of course. Indeed, it is just this easy way of treating vital functions that only too often leads to their abuse. Let the reader pause for a few moments and think how he treats, and has been in the habit of treating, his own patient stomach. Does he begin the day with a heavy breakfast, including several cups of strong tea? Does he take a meat luncheon, with wine or other alcoholic drink? Does he indulge in afternoon tea and wind up with a dinner of half a dozen courses, tempered with more alcohol? If a man, does he distribute odd alcoholic drinks over the whole day's programme? If of either sex, is tobacco included in the daily trials of the stomach? A steady course of public dinners would, in time, ruin the digestion of a rhinoceros or an ostrich. The three square meals a day of the average country house quickly upset the digestion of the visitor, who is used to think highly and live plainly. Indeed, no great intellectual activity can be permanently associated with gluttony. The amount of abuse the modern civilized stomach can withstand is an eternal monument to the perfecting powers of the evolutional survival of the fittest."

INDIAN PLAGUE HORRORS.

A correspondent of the "Scotsman" ("Medical News," Oct. 21) writes concerning the plague in the city and cantonments of Poona, that to Defoe's most realistic pictures of the plague of London must be added the Asiatic peculiarities. There is the funereal pyre of the Hindu for ghastly cremation, deserted the moment it is lit, and then abandoned to the jackals and the vultures. There is the ghoulish Mohammedan cemetery, where the bodies are tossed or dragged, and not one foot of earth covers them. So few of the living are left to remove the dead that, as in London, the death cart goes its rounds and disposes of the victims wholesale. Two-thirds of the city's native population have died or fled, and among the remaining third there are 1,100 deaths a week. Two new features which have lately appeared are the black death and

the fatal infection of Europeans. The latter is chiefly due to the impossibility of nurses and physicians and benevolent persons dealing with the hundreds who crowd the hospitals, "and yet they must work on till they themselves drop." Since Aug. 1, 500 victims a day have filled the General Plague Hospital, notwithstanding the fact that only 104 have been returned as cured in the first fortnight.

FLEAS AND THE TRANSMISSION OF PLAGUE INFECTION.

The rat, as stated in the "Medical Press" (Boston "Medical and Surgical Journal"), according to Hankin, is the animal by which plague infection is conveyed. But the question which has for some time exercised the minds of the plague authorities is: How is the disease transmitted from the rat to man? A good deal of evidence has lately been collected showing that the agent of infection is the flea. Fleas are said to infect rats which are dying of plague, and bacilli, corresponding to the plague bacillus, have been discovered in the intestinal contents of fleas obtained from such rats. Again, fleas from plague-afflicted rats have been made the means of communicating the disease to healthy rats. All the experiments, then, undertaken to test this flea hypothesis, have tended to show, almost without doubt, that the flea plays a most important rôle in the dissemination of plague.

HOSPITALS FOR CONSUMPTIVES NOT A SOURCE OF DANGER.

The following resolution (London "Lancet"), signed by Sir William Broadbent, has been passed by the Council of the National Association for the Prevention of Consumption: "Having understood that apprehension is entertained as to the spread of consumption from sanatoria established for the treatment of this disease, the Council of the National Association for the Prevention of Consumption desire to express their opinion that there is no danger of communication from any well-conducted hospital for consumption, or from any sanatorium where the open-air treatment for this disease is properly carried out, and, further, that the inhabitants of houses in the immediate neighborhood of such institutions are perfectly safe from local propagation from this source."

PRIZE OF THE MASSACHUSETTS ASSOCIATION OF THE BOARDS OF HEALTH.

A prize of $5 is offered by this association for the best essay on "What shall boards of health do officially with persons who are

carrying diphtheria bacilli in their throats or noses, without being ill, to prevent the spread of the disease, and how can these bacilli be most rapidly destroyed?" The essays, which must be typewritten and accompanied by the author's name in a sealed envelope, should be sent before Jan. 15, 1900, to Dr. Henry P. Walcott, 141 State House, Boston, Mass.

AN ALLEGED PREVENTIVE OF THE PLAGUE.

Mr. Shamsudin J. Sulemani, of Baroda, states in the "Lancet" for Sept. 16 (New York "Medical Journal," Oct. 21) that for nearly a year free use has been made in Baroda of certain pills as a preventive of the plague. Each pill contains two grains of quinine, a quarter of a grain each of ipecac and camphor and a quarter of a minim of carbolic acid. A pill is to be taken twice a day. The writer gives observations which convince him that these pills are very efficacious. We can only hope that he is not mistaken.

A NEW CONCEPTION OF TEETOTALISM.

Newspaper medicine (New York "Medical Journal") seems to flourish even in Greece. Dr. Achilles Rose translates as follows a paragraph that appeared in an Athenian daily paper recently: "It is known that the remedy against alcoholism employed in England and in the United States of America consists in the exclusive use of tea as a beverage. The followers of this system are called tee-itself. Many die after a few years of the tea habit, because they totalers [sic]. But the remedy is as pernicious as alcoholism itself. Many die after a few years of the tea habit, because they drink tea too frequently and take overdoses." The writer goes on to state that a certain American dramatic artist, mentioned by name, is the latest victim, and adds: "And now a crusade has been inaugurated in the United States against the use of tea."

MORTALITY AND MORBILITY REPORTS AND REVIEWS.

STATE OF NEW YORK: The sanitary distrits into which the State is divided are as follows: *Maritime District*, includes New York, Brooklyn, Long Island, Staten Island and Westchester County; *Hudson Valley District*, all the counties on either side of the Hudson River, except Westchester, to and including Albany and Rensselaer; *Adirondack and Northern District*, the northern section of the State, the counties of Washington, Warren, Hamilton, Essex,

Clinton, Franklin, St. Lawrence, Jefferson and Lewis; *Mohawk Valley District,* Schenectady, Schoharie, Saratoga, Montgomery, Fulton, Herkimer and Oneida Counties; *Southern Tier District,* the seven counties along the southern border of the State; *East Central District,* Sullivan, Delaware, Otsego, Madison, Chenango, Onondaga and Cortland Counties; *West Central District,* Cayuga, Tompkins, Seneca, Schuyler, Ontario, Yates, Livingston, Genesee and Wyoming Counties; *Lake Ontario and Western District,* Oswego, Wayne, Monroe, Orleans, Niagara and Erie Counties.

State Board of Health Bulletin for September, 1899: Total number of deaths reported, 9,186, 800 less than the preceding month, the death rate having fallen from 17.1 to 15.8. Compared with September of other years, there were 2,300 fewer deaths than in September, 1898, in which month, however, the mortality was excessive, being greater than that of August. The average September mortality of the ten years prior to 1898 was 9,300, which is still a little larger than that of the present month. There have not been so few deaths reported in September since 1890.

The decrease in mortality from August is chiefly in the Maritime and the Lake Ontario and Western districts, that of the Central districts being even greater; the same is true of the diarrhœal mortality. In the five large cities there were 1,500 fewer deaths than in August, and the deaths from diarrhœal diseases were less than half the number in August; in rural towns (rest of district) the total mortality and also the diarrhœal mortality were both nearly the same as in August, the latter constituting 16 per cent. of the deaths, against 8 per cent. in the cities. Typhoid fever caused 205 deaths, being increased by 50 from August, and the increase affected all the health districts. Diphtheria increased in mortality and caused more deaths than in September, 1898. Of 200 violent deaths 37 were from railway accidents, 36 from drowning, 2 from electric car, 12 from suicide.

The rainfall, following dry summer months, was excessive in all parts of the State, with an average of 4.5 inches; the temperature was also 2° below the normal of 63°, with ranges between 40° and 90°; average relative humidity for the month, 73 per cent. and dew point, 48°.

Maritime District, 3,826,000: Total deaths, 5,481; death rate, 17.2; perecentage of deaths under 5 years of age, 40.0; from zymotic diseases per 1,000 from all causes, 155.2; cerebro-spinal meningitis, 30; typhoid fever, 86; malarial diseases, 18; scarlet

fever, 16; measles, 34; whooping-cough, 60; diphtheria, 121; diarrhœal diseases, 472; acute lung diseases, 578; phthisis, 102; cancer, 180.

City of New York, 3,550,053: Total deaths, 5,021; annual death rate, 17.2; deaths under 5 years, 2,117; from cerebro-spinal meningitis, 28; typhoid fever, 80; scarlatina, 16; measles, 33; erysipelas, 4; whooping-cough, 56; diphtheria, 116; diarrhœal diseases, 399; acute lung diseases, 563; phthisis, 568.

Borough of Manhattan, 1,953,569: Total deaths, 2,643; death rate, 16.5; from cerebro-spinal meningitis, 14; typhoid fever, 39; diphtheria, 49; acute lung diseases, 347; phthisis, 278; percentage of deaths under 5 years of age, 42.3.

Borough of the Bronx, 163,537: Total deaths, 284; death rate, 21.1; from diphtheria, 4; diarrhœal diseases, 192.

Many large institutions raise the death rate.

Borough of Brooklyn, 1,231,548: Total deaths, 1,770; death rate, 17.5; from typhoid fever, 30; diphtheria, 56; acute lung disease, 171; phthisis, 89; diarrhœal diseases, 162; percentage of deaths under 5, 43.7.

Borough of Queens, 134,139: Total deaths, 221; death rate, 20; from diphtheria, 6; diarrhœal diseases, 14; acute lung diseases, 17; phthisis, 14; percentage of deaths under 5, 41.

Borough of Richmond, 67,260: Total deaths, 103; death rate, 18.6; acute lung diseases, 9; phthisis, 10; percentage of deaths under 5, 38.8.

Cuspidors in Factories.

October 21 a new section was added to the Sanitary Code requiring that all places operated by persons or corporations employing ten or more persons in the manufacture of cigars and in printing establishments must provide receptacles at the ratio of one receptacle for every two employés. These receptacles must be cleaned and disinfected not less than once a day.

Of fifteen other towns and villages in the Maritime District, with population ranging from 3,000 to 42,000, the lowest death rate was of North Hempstead (8,726), 10.5; the highest, Sag Harbor (3,000), 40.

Hudson Valley District, 700,000: Total deaths, 826; death rate, 14.3; percentage of deaths under 5 years, 184.1; zymotic deaths per 1,000 from all causes, 184.1; cerebro-spinal meningitis, 9; typhoid fever, 19; diphtheria, 23; diarrhœal diseases, 90; acute lung diseases, 45; phthisis, 85; cancer, 42.

Albany, 100,000: Total deaths, 135; death rate, 16.6; from typhoid fever, 1; diarrhœal diseases, 5; acute lung diseases, 11; phthisis, 16.

Troy, 65,000: Total deaths, 89; death rate, 16.6; percentage of deaths under 5, 31.1; from typhoid fever, 1; diarrhœal diseases, 19; acute lung diseases, 8; phthisis, 10.

Of twenty-eight other towns and villages in this district, with range of population from 3,000 to 36,000, the lowest death rates were of Port Jervis (9,327) and Nyack (5,603), each 6; the highest, Montgomery (5,259), 27.3.

Adirondack and Northern District, 390,000: Total deaths, 439; death rate, 13.7; percentage of deaths under 5 years, 26.6; zymotic diseases per 1,000 from all causes, 272.7; cerebro-spinal meningitis, 3; typhoid fever, 26; diarrhœal diseases, 83; acute lung diseases, 18; phthisis, 37; cancer, 16.

Of seventeen towns and villages in the district, with populations ranging from 3,000 to 17,000, the lowest death rate was of Cape Vincent (3,000), 4; the highest, Watertown (17,000), 35.

Mohawk Valley District, 395,000: Total deaths, 459; death rate, 14; percentage of deaths under 5, 25.7; zymotic diseases per 1,000 from all causes, 152; cerebro-spinal meningitis, 2; typhoid fever, 14; diarrhœal diseases, 45; acute lung diseases, 16; phthisis, 29; cancer, 26.

Utica, 55,000: Total deaths, 89; death rate, 19.7; percentage of deaths under 5, 20.3; from typhoid fever, 3; diphtheria, 3; phthisis, 7.

Of eight other towns and villages in this district the lowest death rate was of Camden (3,675), 6.5; the highest, Boonville (3,512), 27.

Southern Tier District, 425,000: Total deaths, 415; death rate, 12; percentage of deaths under 5, 18.3; from zymotic diseases per 1,000 from all causes, 204.8; cerebro-spinal meningitis, 3; typhoid fever, 15; diphtheria, 9; diarrhœal diseases, 56; acute lung diseases, 13; phthisis, 31; cancer, 15.

Binghamton, 45,000: Total deaths, 54; death rate, 14.6; percentage of deaths under 5, 20.3; from zymotic diseases per 1,000 from all causes, 222.2; typhoid fever, 2; diphtheria, 2; acute lung diseases, 4; phthisis, 4; cancer, 4.

Elmira, 40,000: Total deaths, 36; death rate, 11; percentage of deaths under 5, 14; from zymotic diseases per 1,000 from all causes, 111.1; diphtheria, 3; phthisis, 4; cancer, 3.

Of fourteen other towns and villages in this district, with populations ranging from 3,000 to 18,627, the lowest death rates were of Owego (6,000) and Olean (10,000), each 6; the highest, Salamanca (3,700), 18.

East Central District, 415,000: Total deaths, 414; death rate, 12; percentage of deaths under 5 years, 11.3; from zymotic diseases per 1,000 from all causes, 197.5; from cerebro-spinal fever, 2; typhoid fever, 19; diphtheria, 6; diarrhœal diseases, 50; acute lung diseases, 18; phthisis, 42; cancer, 22.

Syracuse, 120,000: Total deaths, 111; death rate, 11.3; percentage of deaths under 5, 25.2; from typhoid fever, 3; diphtheria, 5; acute lung diseases, 7; phthisis, 12; cancer, 5.

Of fifteen other towns and villages in this district, with populations ranging from 2,670 to 8,600, the lowest death rate was of Oneonta (8,000), 8.5; the highest, Homer (3,000), 20.

West Central District, 325,000: Total deaths, 350; death rate, 13.6; percentage of deaths under 5, 18.8; from zymotic diseases per 1,000 from all causes, 160; typhoid fever, 7; diarrhœal diseases, 45; acute lung diseases, 22; phthisis, 27; cancer, 24.

Auburn, 35,000: Total deaths, 33; death rate, 11.5; percentage of deaths under 5, 18.8; from zymotic diseases per 1,000 from all causes, 151.2; from acute lung diseases, 22; phthisis, 27; cancer, 4.

Of thirteen other towns and villages in this district the lowest death rate was of Batavia (7,221), 6; the highest, Seneca Falls (6,500), 20.3.

Lake Ontario and Western District, 875,000: Total deaths, 865; death rate, 12; percentage of deaths under 5 years, 26.6; from zymotic diseases per 1,000 from all causes, 203.5; cerebro-spinal meningitis, 7; typhoid fever, 19; diphtheria, 14; diarrhœal diseases, 131; acute lung diseases, 45; phthisis, 18; cancer, 15.

Buffalo, 360,000: Total deaths, 314; death rate, 10.6; percentage of deaths under 5, 32.5; from zymotic diseases per 1,000 from all causes, 235.6; cerebro-spinal meningitis, 4; typhoid fever, 9; diphtheria, 8; diarrhœal diseases, 50; acute lung diseases, 18; phthisis, 31; cancer, 13.

Rochester, 175,000: Total deaths, 166; death rate, 11.5; percentage of deaths under 5, 22.3; from zymotic diseases, per 1,000 from all causes, 144.5; diphtheria, 5; diarrhœal diseases, 15; acute lung diseases, 11; phthisis, 24; cancer, 8.

Of fifteen other towns and villages, with a range of population

of 3,637 to 22,000, the lowest death rate was of Newark (4,600), 7.8; the highest, Fulton (4,214), 22.8.

Totals for the whole State, 7,110,000; total deaths, 9,186; death rate, 15.8; deaths under 5 years, 3,068; percentage of deaths under 5 to total mortality, 33.4; from zymotic diseases per 1,000 from all causes, 172.2; cerebro-spinal meningitis, 57; typhoid fever, 205; malarial diseases, 21; scarlet fever, 19; measles, 34; erysipelas, 6; whooping-cough, 85; diphtheria, 183; diarrhœal diseases, 972; acute lung diseases, 755; phthisis, 947; puerperal diseases, 50; diseases of digestive system (not diarrhœal), 1,065; diseases of the urinary system, 646; diseases of circulating system, 729; diseases of nervous system, 937; cancer, 366; accidents and violence, 537; old age, 327; unclassified, 247.

Annual Report for 1897, two volumes: 1. pp. 585; 2, maps of Sewerage Systems and Sewage Disposal Works.—The protection of the water supplies and the promotion of works for the disposal of sewage constituted the chief work of the Board, as for several years preceding, comprehending twelve systems improved upon or originated and progressed during the year. The number of municipalities for which plans for sewerage systems and sewage disposal works have been approved of and undertaken under the auspices of the Board, during and since the year 1888, now amounts to 73. Corresponding progress has been made in regulations for the protection of the water supplies. Of some thirty nuisances that required special investigation and report during the year none appears of longer standing or more crying than that of Newtown Creek—through a portion of Brooklyn—still is, as it has been for twenty years, despite a dozen or more investigations and condemnations by the State Board of Health and several proclamations by different Governors for its speedy abatement. Brooklyn continues to make it the outfall of a portion of her sewage, and, so long as she does so, it will be difficult to prohibit additional pollution by factory drainage along its banks.

Barren Island, the site of New York City garbage disposal and a private rendering enterprise, still evolves foul odors to some extent over Brooklyn's precincts, but the apparent necessity of this site—there being no other available—for the disposal of the city garbage, has been the means of stimulating efforts for the prevention or destruction of the odors common to such establishments, to such a degree as, ere long, to promise success. Nevertheless the health authorities cannot afford to dispense with continued supervision.

The "Tuberculosis Committee" reports gratifying results of educational work among cattle owners on the danger of tuberculosis, but embarrassment of progress on account of restricted appropriation. "It is obviously impossible" (the committee reports), "with the small amount of money at our disposal, to ward off the attacks made upon the health of the people of the State as effectively as the conditions demand. The protection of the milk supply of the State is a matter of much greater importance from a sanitary standpoint than the inspection of beef cattle now sold, carefully carried on by the Federal Bureau of Animal Industry.

"Under the law we are permitted to kill all tuberculous cattle, and, if in the possession of the owner for a period of less than three months, they cannot ask for appraisal or indemnity."

Sanitary conditions of the State and summary of mortality are, for the most part, made up of the monthly bulletins. There were 118,000 deaths from all causes; death rate, 18 per 1,000 of population. Percentage of deaths under 5 years of age, 30.5; deaths from zymotic diseases, 141 per 1,000 from all causes; from phthisis, 108 per 1,000 from all causes. The lowest mortality from phthisis was in the Southern Tier District, 75 per 1,000 from all causes; the highest in the Maritime and Hudson Valley districts, 115 per 1,000. The mortality from zymotic diseases appears closely related to and greater proportionately with density of population, typhoid fever being the only exception in this respect.

CALIFORNIA.—The State Board of Health has wisely concluded not to quarantine against consumption from other States, but recommends that in all State institutions those afflicted with tuberculosis be separated from the other inmates. This is a sensible regulation, which ought to be deemed necessary in all curative institutions. Consumption is communicable, and that fact should determine the action of physicians and sanitarians.

San Francisco, 360,000. Board of Health reports for September: total deaths, 512—81 under 5 years; death rate, 17.06. Deaths from specific febrile diseases, 23—cerebro-spinal meningitis 4, diphtheria 6, typhoid fever 9; phthisis, 75; cancer, 22.

Los Angeles, 103,000: October, total deaths 119—18 under 5 years; death rate, 13.86. Deaths from specific infectious diseases, 24—diphtheria 3, typhoid fever 4, cerebro-spinal meningitis 6, tuberculosis 8; phthisis, 17 (6 had been here less than 10 years); cancer, 6.

COLORADO.—Denver, Oct. 13: The semi-annual report of the Secretary of the State Board of Health was delivered to Governor Thomas yesterday. The document dwells upon the subject of smallpox, tuberculosis, contagious diseases of various kinds, the embalming of corpses and vital statistics. It shows that from March 25 to September 28 there were 263 cases of smallpox, and 36 deaths therefrom. Special reference is paid to the suppression of contagious diseases in schools. Speaking of the laws governing the collection of vital statistics, the report declares they are worthless under the present system of securing them.

Denver, Nov. 3: Typhoid fever continues prevalent. One of the reasons ("Denver Post") assigned for it is the consumptipn of water tainted with refuse, dead cows, wallowing cattle. The great Marston lake reservoir of the Denver Union Water Company is fed by a ditch so polluted that the farmers along its course are registering a protest and are taking steps to warn the people of Denver.

CONNECTICUT.—State Board of Health Bulletin for September: Deaths reported from 165 towns with aggregate population of 910,354, 1,142—240 less than reported in August, and 209 less than in September of last year, and 74 less than the average number of deaths in September for the five years preceding the present. Percentage of deaths under 5 years of total mortality, 27.7. Death rate was 14.9 for the large towns; for the small towns 15.3, and for the whole State 15.0. Deaths from zymotic diseases, 292—25.5 per cent. of the total mortality.

The Secretary remarks: "As the bookkeeping of public hygiene improves in recording deaths, and the causes of death, and as the practice of reporting and registering cases of sickness is also being perfected, the fact is recognized more and more every year that a large proportion of the victims of infectious diseases are among those who have been visitors of the various summer resorts, whether in this State or in neighboring States. It is conspicuously evident in the many outbreaks of typhoid fever among the students during the first two or three weeks of the fall term in colleges. . . . The State Board of Health of Connecticut has more than once traced the origin of a widespread prevalence of typhoid fever to infection incurred at a summer hotel, and developed after the return of its guests to their scattered homes. . . . Outbreaks of typhoid have already been reported as ac-

quired at several places along the Connecticut shore, among the residents of the cottages. A quite severe epidemic of typhoid appeared within a limited area of South Manchester. Over twenty cases occurred during the months of August and September. An investigation is going on to find, if possible, the source of infection."

Hartford, Nov. 3: Dr. E. K. Root, recently appointed member of the City Board of Health, has been elected president of the board. Dr. Root has been the medical inspector of the board for several years, and was appointed a member of the State Board of Health by Governor George E. Lounsbury at the last session of the Legislature.

DISTRICT OF COLUMBIA, 287,462—89,030 colored. Reports for four weeks ending Nov. 4: Total deaths, 408—182 colored. Deaths under 5 years of age, 110. Death-rates, white, 14.83; colored, 27.82: 18.54. Deaths from typhoid fever, 27; cerebro-spinal meningitis, 7; diphtheria, 19; phthisis, 58; cancer, 16.

Report for the fiscal year ending June 30, 1899: "The total number of deaths from all causes was 6,026, 611 more than for the preceding year. The annual death rate rose, therefore, from 19.32 per 1,000 to 20.96 and was 0.37 in excess of the average for the past five years. Of the decedents, 3,372 were white and 2,654 colored, an increase of 399 in the former and of 212 in the latter. The death rate for the whites increased from 15.53 to 16.99, or 9.40 per cent., and that for the colored from 27.51 to 29.81, or 8.36 per cent. The average death rates for the past five years were, for the whites, 16.82, and for the colored, 28.72. Deaths from zymotic diseases, 998—106 more than in the previous year. The typhoid fever death rate rose from 0.46 per 1,000 to 0.60. The average annual death rate from this disease during the past five years has been 0.63. A part of the increase during the year was due to the presence of a large number of soldiers, who were, or recently had been, living in military camps; but this alone is not sufficient to account for the apparently increased prevalence of this malady. Deaths from diphtheria increased from 130 to 174 during the year. From whooping-cough, the number of deaths decreased from 84 to 12. From scarlet fever there was an increase from 13 to 19. From influenza the number of deaths increased from 40 to 152, and the death rate from 0.139 per 1,000 to 0.521. The average number of deaths per month was 12.66, but

in five months there were no deaths from this cause. Of cerebro-spinal meningitis, the Health Officer remarks: "In the absence of a more or less widely spread epidemic of cerębro-spinal meningitis, it is necessary to regard inflammation of the cerebro-spinal meninges as of the non-specific type, but when deaths from such inflammation become more frequent there is a tendency to charge all, or nearly all, to the specific type of the disease. Comparisons with previous records may, therefore, be misleading, and it is sufficient to state that no deaths have been charged to epidemic cerebro-spinal meningitis during any year recently preceding that covered by this report. The marked excess of the death rate among the colored people over that among the whites, 0.30 per 1,000 as compared with 0.11, is worthy of remark. So also is the large number of cases which occurred in the southwestern part of the city." Dr. Wm. B. French, who was appointed to investigate epidemic cerebro-spinal meningitis, will submit a special report.

FLORIDA.—About the *Yellow Fever:*

"Jacksonville, Fla., Nov. 3, 1899.

"Editor SANITARIAN:

"Permit me to invite your attention to an error which occurs on about the twentieth line of page 464 of the November SANITARIAN, where it is stated: 'During the same interval there have been several cases, one fatal, at Miami, and one case at Tampa.' It is in relation to Tampa that I desire the correction made. There has been no case of yellow fever at Tampa during the past year, nor has there been even a suspicious case. Kindly give this correction the same prominence enjoyed by the article from which I quote, and greatly oblige,

"Very truly yours,

"JOSEPH Y. PORTER,

"State Health Officer."

The error referred to was the dropping of the word "Port" before Tampa: Port Tampa was the place where one case had been reported during the interval, etc., SANITARIAN for November, p. 464, twentieth line from top.

We should be sorry to exaggerate the spread of yellow fever in Florida during the past summer and autumn, now, apparently, almost exhausted by the want of susceptible subjects in Key West —out of the pale of climatic influence: Nov. 9th, 2 new cases; the total number of cases reported to that date, since Aug. 31, summed up from "Public Health Reports," being 1,290, with 66

deaths; in Miami, Sept. 5 to Nov. 6: 74 cases, with 5 deaths; in *Port Tampa*, Sept. 10, one case, fatal: an amazingly small mortality. But it should be borne in mind that yellow fever is an exceedingly capricious disease in this respect: no long practised observer will predicate the mortality of future epidemics upon this one.

ILLINOIS.—Chicago, 1,650,000—23,000 colored: Deaths from all causes in September, 1899, 1,822—731 under five years of age; death rates: white, 14.94; colored, 27.22: 15.11. Deaths from diphtheria, 75; typhoid fever, 58; scarlet fever, 31; whooping-cough, 11; measles, 9; phthisis, 173; other tubercular diseases, 34; cancer, 81.

Nov. 2 ("Tribune"): "Including the twenty-one cases of diphtheria and thirty-seven cases of scarlet fever, which were reported yesterday to the Health Department, the total number of cases of those two contagious diseases reported since the opening of the schools has reached 2,008. Fully 90 per cent. of those cases are of school children and nearly every new case may be traced to direct infection by contact with other children sent back to school by their parents before they were free from contagion."

Dr. Christopher, of the Board of Education, urges the appointment of medical inspectors of the schools after the plan of New York and Boston, which meets general favor.

Typhoid fever is reported prevalent in Genoa, and among the patients in Kankakee insane hospital.

IOWA.—Health Bulletin for October reports outbreaks of infectious diseases for September, 1899, as follows: Diphtheria in Glenwood, Oskaloosa, Lyon township, Mills county; Jacobson township, Washington county; Lincoln township, Warren county; Boone, Owasa, Centerville, Sioux City, Le Claire, Ottumwa. Scarlet fever—Lincoln township, Warren county; Sac City; Cedar township, Sac county; Holman township, Osceola county; Springfield township, Cedar county; Bennett, Corning, Pocahontas; Jackson township, Jones county. Typhoid fever—Kirkville, Arion; Franklin township, Story county; Jefferson township, Poweshiek county; Tremont township, Benton county; Burlington, Davenport, Des Moines, Ottumwa, Sioux City, Storm Lake, Ottumwa. Whooping-cough—Farragut, Cedar Falls, Storm Lake, Denison. Mortuary reports of thirteen towns with aggregate population 216,000, for September, total deaths, 188. From typhoid fever, 11; diphtheria, 4; phthisis, 20; cancer, 10.

KENTUCKY.—Lexington, Nov. 13: *Typhoid fever* is epidemic in the University—forty students down with it. The students have been sent to the Good Samaritan Hospital, but since there is no more room at the institution, it has become necessary to care for them at their boarding houses. The cause was at first attributed to the water, but now some members of the Faculty believe it was due to milk from cows fed on distillery slop.

LOUISIANA.—New Orleans, Aug. 31 to Nov. 6: Total cases of *yellow fever,* summed up from Public Health Reports, 81, with 18 deaths.

MAINE.—Annual report of vital statistics for 1897: Population, eleventh census, 1890, 661,086—12,150 increase in the decade from 1880. By the same ratio of increase the population in 1897 was about 700,000. Births reported, 15,142—287 decrease from previous year; marriages, 5,331—248 decrease; divorces decreed, 722—54 more than for previous year, and in the proportion of one for every 7.4 marriages. Deaths, 11,236—610 more than in pervious year. Investigation of the causes of the increased mortality reveals that it was chiefly due to influenza, pneumonia, diseases of the nervous system, and diphtheria. Death rate (on 661,086), 16.99. This is the sum of the reports in detail for the several counties.

The chief causes of death, and in the order of the greater numbers, were: Phthisis, 1,128; infantile diarrhœa, 528; cancer, 463; influenza, 294; tubercular diseases other than phthisis, 210; diphtheria, 200; typhoid fever, 151; diabetes mellitus, 95; croup, 76.

MARYLAND.—Baltimore, 541,000—78,000 colored. Deaths reported for August, 1899, 886, an increase of 6 compared with the corresponding month of August, 1898. Of these 707 were whites and 179 colored; a death rate of 17.98 per 1,000 for the former and 27.53 per 1,000 for the latter. The death rate per 1,000 for the whole population was 19.36; 137 died from infectious diseases, 57 from consumption, 29 from pneumonia, 13 from bronchitis, 9 from influenza, 43 from Bright's disease, and 25 from typhoid fever; 365, or 41.91 per cent. of the total deaths were in children under five years of age.

For the month of September the total deaths were 747, a decrease of 123 compared with the corresponding month of September, 1898. Of these 584 were whites and 163 colored; a death rate of 15.31 per 1,000 for the former and 25.07 per

1,000 for the latter. The death rate per 1,000 for the whole population was 16.57; 50 died from infectious diseases, 75 from consumption, 24 from pneumonia, 15 from bronchitis, 39 from Bright's disease, and 24 from typhoid fever; 286, or 38.28 per cent. of the total deaths, were of children under five years of age.

MASSACHUSETTS.—Boston, 541,827. Health Department report for September, '99: Total deaths, 876—326 under five years; death rate, 19.40. Deaths from zymotic diseases, 147—diphtheria (and croup) 29, typhoid fever 32, cholera infantum 35, whooping-cough 9, alcoholism 8; phthisis, 72; cancer, 28. Cases of contagious diseases reported during the month: Diphtheria, 256; typhoid fever, 133; scarlatina, 84; measles, 13.

Brookline and Cambridge both have many cases of diphtheria. The Cambridge hospital is now (Oct. 27) so crowded with patients that no more can be admitted.—Dr. Eugene A. Darling has been appointed bacteriologist of the Cambridge Board of Health, to succeed Dr. George B. Henshaw.

MICHIGAN.—The Secretary of the State Board of Health reports for the month of October, '99, compared with the preceding month, influenza, typhoid fever and tonsilitis increased, and cholera infantum, dysentery, cholera morbus, inflammation of bowels and diarrhœa decreased in area of prevalence. Including reports by regular observers and others, consumption was reported present at 207 places, typhoid fever at 234 places, scarlet fever at 115 places, diphtheria at 60 places, measles at 34 places, whooping-cough at 27 places, cerebro-spinal meningitis at 11 places, and smallpox at 9 places. Consumption was reported at 2 places more, typhoid fever at 55 places more, scarlet fever at 29 places more, diphtheria at 19 places more, measles at 14 places more, whooping-cough at 1 place more, cerebro-spinal meningitis at 3 places more, and smallpox at 7 places more, when compared with the preceding month.

Mortality report not received.

MINNESOTA.—Minneapolis, 225,602. Health Commissioners' report for September, '99: Deaths, 141—41 under 5 years. Death rate, 9.19. Deaths from zymotic diseases, 27—typhoid fever, diphtheria, 5; phthisis, 13; cancer, 10.

St. Paul, 200,000. Health reports for September, '99: Deaths, 125—49 under 5 years; death rate, 7.50. Deaths from zymotic

diseases, 8—typhoid fever 4, diphtheria 2, whooping-cough 2; phthisis, 17; tuberculosis, 5; cancer, 5.

MISSISSIPPI.—*Yellow fever* has continued in Jackson since our October summary, the latest case reported Nov. 1. Total number of cases reported (Public Health Reports) Sept. 10 to Nov. 1, 61, with 9 deaths. There is general rejoicing, as also in New Orleans and in Florida, that the quarantines have been lifted; and, more than ever before, in default of knowledge that the disease was introduced from foreign sources into any of the places where it has prevailed this year, attention has reverted to local conditions.

MISSOURI.—St. Louis, 623,000—36,000 colored. Health Commissioner's report for September, '99: Deaths, 743—204 under 5 years; death rate, 14.3. Deaths from zymotic diseases, 131—diphtheria (and croup) 18, typhoid fever 16; phthisis, 69; cancer, 29.

Smallpox is reported prevalent in Joplin and Springfield. In Springfield 138 cases, altogether, 38 white and 100 colored, have been reported (Oct. 27), Health Officer John F. Cunningham among them; he had a mild attack and is now well.

MONTANA.—Helena, Nov. 8: U. S. Senator Thomas H. Carter was arrested to-day and fined $1 for spitting on the sidewalk. The complaint was made by a man arrested and fined yesterday for the same offense. The fine was paid.

NEBRASKA.—Diphtheria is prevalent in Nebraska City.

NEW JERSEY.—Newark, 240,000. Health Officer's report for four weeks ending Oct. 28, '99: Deaths, 281—92 under 5 years; death rate, 15.22. Deaths from diphtheria, 10; phthisis, 38; cancer, 11.

Princeton, Oct. 25.—The public schools were closed to-day for a period of ten days to prevent the spread of diphtheria. It exists at various places in the State, but not very extensively anywhere. On its appearance in Princeton, it was thought best by the health authorities to close the public schools for a few days, since there is reason to think that association of scholars there may have been responsible for the diffusion of the disease in the town.

NORTH CAROLINA.—Bulletin of the State Board of Health re-

ports returns from twenty-one towns for September, '99, aggregate population 155,700—64,099 colored: total deaths 217—110 colored; 83 under 5 years of age. Death rates: White, 14.0; colored, 20.6: 16.7. Deaths from typhoid fever, 12; malarial fever, 13; phthisis, 15.

OHIO.—Cincinnati, 405,000. Health Officer's report for September, '99: Deaths, 386—119 under 5 years; death rate, 11.44. Deaths from zymotic diseases, 46—diphtheria (and croup), 9; cerebro-spinal meningitis, 3; typhoid fever, 3; phthisis, 45; cancer, 8.

Cleveland, 395,000. Health Officer's report for September, '99: Deaths, 412—153 under 5 years; death rate, 12.51. Deaths from zymotic diseases, 33—diphtheria (and croup), 16; typhoid fever, 9; cerebro-spinal fever, 4; phthisis (13, tuberculosis, 23), 36; cancer, 14.

Youngstown, Nov. 1: *Diphtheria* increasingly prevalent.

PENNSYLVANIA.—Philadelphia, 1,266,832, 4 weeks, Oct. 20, '99: Total deaths, 1,536; under 5 years, 413; death rate, 14.58; deaths from typhoid fever, 94; diphtheria, 67; phthisis, 94; cancer, 48.

Ineffective School Inspections.—The general expression of opinion among the principals of schools is that the inspection is now ineffective. There are, on an average, 300 cases of contagious diseases each week, which are now divided among twelve physicians, making an average of twenty-five cases a week for each inspector. The inspectors exercise general supervision over districts ranging from 75,000 inhabitants in the less thickly settled sections to 150,000 in the centres of population. The assertion is made that to attend to this work alone fully the number of physicians that make up the old Board, fifteen, should be employed. The Medical Inspector is required to give attention to the contagious diseases reported by physicians, to find out the number of public school scholars in a family in which there is contagious diseases, and report the number to the principal; to placard the premises and "generally to exercise a supervision of the sanitary condition of his district." In addition to all this is the inspection of two schools a day, for the purpose of excluding all suspicious cases.

The Typhoid Fever Epidemic in the Hungarian quarter in Woods Run has reached an alarming stage. During the past month the overcrowded foreign boarding-houses and filthy slums

have almost filled the fever wards of St. John's Hospital with charity patients, and there are dozens of persons afflicted with typhoid spreading contagion among the residents of the congested districts. Allegheny City, according to the records of the Department of Charities, is encouraging disease in Woods Run by providing for the afflicted, instead of adopting immediate measures to check the epidemic of typhoid which now reigns by exterminating the fifty or more filth holes that infest lower Allegheny. (Oct. 21) The Department of Charities thus far this month has provided for 23 cases of typhoid, and fully two-thirds of this number of the patients were foreigners living in small houses occupied by from 15 to as high as 60 boarders.

Pittsburg, 305,000, 5 weeks, Oct. 28, '99: Total deaths, 416—126 under 5 years; death rate, 17.7; from tpyhoid fever, 32; diphtheria, 10; phthisis, 27; cancer, 13.

Oct. 27: Typhoid fever and diphtheria are also generally prevalent over the town, the number of cases of the former disease for the first nine months of '99 being almost equal to the total number for the twelve months of last year. Typhoid fever for this year received a start in January with 162 cases; February had 75; March, 98; April, 149; May, 126; June, 87; July, 165; August, 327; September, 232, and October, still unfinished, 166.

Lancaster, Nov. 1: Diphtheria continues prevalent. In Upland also so severely that (Nov. 7) all the schools throughout the borough were ordered closed for at least two weeks.

South Carolina.—Charleston, 65,165—36,295 colored, 2 weeks, Oct. 21, '99: Total deaths, 58—38 colored; under 5 years, 10; death rates, white, 15.30; colored, 26.89: 21.09; deaths from typhoid fever, 2; phthisis, 2; cancer, 2.

Tennessee.—Nashville, Oct. 21: The State Board of Health has adopted resolutions declaring tuberculosis a contagious and infectious disease and directing that all inmates of State institutions afflicted with it be isolated in rooms or wards set aside for such patients and not permitted to associate with other inmates.

Texas.—Austin, Nov. 4: All quarantines against New Orleans were raised yesterday. This act, it is taken for granted by the Texas authorities, will put an end to the injunction proceedings and purposed decision of the Supreme Court, instituted by Louisiana authorities against Texas' or any other State's right to inter-

cept commerce, as Texas has done during the past summer under the pretext of preventing introduction of an epidemic disease regardless of restrictions practiced at the place of departure against the transportation of any such disease. It is to be hoped, however, that Louisiana will continue to urge the question till a decision is reached.

UTAH.—Salt Lake City ("Herald"), Oct. 29: Thirty-five quarantine flags are outstanding, covering forty-six cases of scarlet fever and three of diphtheria. Eleven new cases of typhoid fever were reported last week.

WASHINGTON.—Seattle, 75,000, September, '99: Total deaths, 50—19 under 5 years; death rate, 8; deaths from typhoid fever, 4; phthisis, 6; cancer, 3.

WISCONSIN.—Milwaukee, 285,000. Health Commissioner's report for September, '99: Deaths, 262—126 under 5 years; death rate, 11.21. Deaths from zymotic diseases, 30—diphtheria, 10; typhoid fever, 5; scarlet fever, 3; whooping-cough, 2; phthisis, 32; cancer, 15. *Diphtheria* is reported (Nov. 4) prevalent in Sankville and Belot.

CUBA.—Havana, Nov. 2: Reports of *yellow fever* for October show that at the beginning of the month there were in the hospitals twelve patients who had been attacked by the disease in September. The new cases in October numbered 63; deaths, 25; recoveries, 26; under treatment, 24; Spanish cases, 36; deaths, 15; American cases, 20; deaths, 8. Total number of fatal cases for the year is 63. October was, as usual, the worst month. The disease is now decreasing.

VACCINATION IN PUERTO RICO.

"Office of the Superior Board of Health of Puerto Rico.
"SAN JUAN, Nov. 11, 1899.

"EDITOR SANITARIAN: In your article on collective reports on 'Glycerinized Vaccine Lymph' (November number) you quote me as stating that the vaccination in Puerto Rico was done with glycerinized virus. The truth is that almost all the vaccination was done with virus on points. The glycerine used here was very small in amount, and only after it was specially prepared or called triple strength succeeded. Thousands of troops were vaccinated here with glycerinized virus, with results almost wholly failures,

except with especially prepared virus. All such virus received here had undergone some decomposition or fermentation. . . . We vaccinated 800,000 persons, but I do not think more than 3,000 were vaccinated with glycerinated lymph. The virus used was produced on the island, because of the great difficulty of obtaining same from the States. GEO. G. GOFF, Secretary."

The article referred to was taken from and credited to the "American Gynecological and Obstetrical Journal."

BUBONIC PLAGUE.

TRIESTE, Nov. 15.—The captain of the Austrian Lloyd steamer Bernice, from Santos for Trieste, reports from the Cape Verde Island (Nov. 5) that he has the plague on board and that three of those attacked had since died.

OPORTO, Nov. 15.—Five additional plague cases were reported yesterday, with one death from the same cause. King Charles visited the Pestana Hospital yesterday.

LISBON, Nov. 15.—Dr. Camara Pestana, Director of the Bacteriological Institute, died here to-day of the plague. He contracted the disease while attending patients.

RIO DE JANEIRO, Nov. 15.—The pest has appeared at several places in Brazil outside of Rio de Janeiro. At Santos, in particular, there had been reported up to Nov. 4, 18 cases with 6 deaths.

LORD CROMER, London "Star" (Oct. 1, 1899), announces the final defeat of "General Plague" in Alexandria by the army of sanitation so ably led by Sir John Rogers, the Director-General of the Sanitary Department under the Egyptian Government. That is to say, he has taken measures to insure the detection of all cases of plague, to isolate the sick, to segregate for an adequate period those known to have been exposed to risk of infection, and to wage relentless war with the dirt in which the plague organism lurks. These measures have been entirely successful in a city of more than three hundred thousand inhabitants. Nevertheless, the advocates of M. Haffkine's system of preventive inoculation have severely criticised the Director-General's methods. The "Times" takes occasion to remind the advocates of inoculation that it cannot be made to supersede sanitation upon the lines pursued by Sir John Rogers, if only because, when plague appears in an epidemic form in a large population, it is impossible to overtake it by inoculation alone. More than that, it is plain that inoculation could never have lowered the general mortality of Alexandria.

MORTALITY STATISTICS ABROAD FOR THE THIRD QUARTER 1899. —Population; total mortality; annual death rate per 1,000; deaths from measles; scarlatina; typhoid fever; diphtheria; diarrhœal diseases:

London, 4,746,752; 23,359; 18.7; 540; 87; 177; 456; 6,087. Glasgow, 733,903; 3,811; 20.6; 1,146; 124; 49; 58; 26; 662. Liverpool, 634,212; 4,725; 29.8; 1,938; 104; 41; 48; 49; 1,034. Manchester, 543,902; 3,673; 26.8; 1,523; 116; 8; 21; 19; 924. Birmingham, 514,956; 3,101; 23.9; 1,458; 60; 8; 18; 37; 752. Leeds, 423,889; 2,139; 16.6; 849; 37; 18; 18; 79; 351. Sheffield, 361,169; 2,469; 27.4; 1,085; 103; 25; 51; 105; 502. Dublin, 349,-594; 2,602; 29.4; 706; 189; 12; 59; 16; 437. Bristol, 320,911; 1,401; 17.5; 530; 7; 3; 8; 7; 291. Belfast, 304,610; 1,992; 25.9; 627; 24; 5; 99; 7; 215. Edinburgh, 298,927; 1,385; 18.5; 390; 7; 7; 19; 12; 192. Nottingham, 239,304; 1,410; 23.7; 634; 28; 12; 21; 9; 347. Bradford, 236,241; 1,101; 18.8; 409; 14; 27; 8; 4; 200. Hull, 234,270; 1,235; 21.4; 557; 10; 6; 17; 4; 298. Newcastle, 228,625; 1,365; 24.3; 561; 11; 5; 13; 11; 135. Salford, 218,244; 1,582; 27.5; 678; 59; 12; 29; 15; 350. Leicester, 213,851; 1,067; 20.6; 504; 4; 11; 10; 55; 251. Portsmouth, 190,-741; 1,064; 22.7; 452; 12; 3; 29; 16; 286. Cardiff, 185,826; 857; 19.2; 385; (?); (?); 12; 18; 150. Brighton, 123,226; 671; 21.9; 259; 1; 1; 8; 15; 174. Norwich, 113,266; 518; 18.5; 235; (?); 4; 9; 7; 134. Plymouth, 100,637; 588; 23.6; 262; 2; 2; (?); 3; 88. Amsterdam, 515,027; 1,866; 12.8; 667; (?); 2; 19; 6; 396. Rotterdam, 309,307; 1,511; 20.2; 672; 1; 2; 14; 12; (?). La Haye, 199,285; 855; 17.4; 350; (?); 1; 1; 5; (?). Paris, 2,511,-629; 11,626; 17.4; 2;276; 241; 41; 242; 61; 1,538. Lyons, 488,-798; 2,279; 17.1; 439; 11; 6; 73; 9; 306. Lille, 222,779; 1,416; 24.2; 654; 23; 1; 1; 2; 561. Saint-Etienne, 135,784; 713; 21.0; 155; (?); 8; 16; 1; 133. Roubaix, 124,447; 652; 20.9; 292; 14; (?); 4; 1; 272. Le Havre, 119,470; 1,090; 36.5; 431; 1; (?); 33; 3; 413. Rouen, 114,817; 894; 30.8; 343; 6; 1; 8; 2; 293. Nice, 114,121; 415; 14.2; 82; 5: (?): 12; 1; 52. Reims, 107,963; 685; 25.4; 277; (?); 2; 19; (?); 251. Nancy, 99,012; 460; 18.6; 119; 6; 1; 15; 1; 76. Dunkirk, 39,718; 203; 20.4; 96; (?); 1; (?); (?); 75. Pau, 33,072; 149; 18.0; 16; (?); (?); 2; (?); 11. Berlin, 1,747,903; 9,378; 21.6; 4,277; 187; 147; 37; 119; 2,761. Hamburg, 675,351; 3,396; 20.0; 1,718; 1; 10; 8; 30; 808. Munich, 444,000; 2,610; 18.8; 1,196; (?); 2; 4; 18; 728. Leipzig, 430,765; 2,708; 22.7; 1,579; 23; 19; 6; 10; 1,078. Breslau,

406,461; 2,867; 28.9; 1,310; 13; 29; 9; 19; 828. Dresden, 389,-300; 2,081; 21.8; 981; 11; 8; 11; 18; 491. Cologne, 353,000; 2,709; 31.7; 1,669; 40; 5; 12; 14; 1,033. Frankfort-on-Main, 250,932; 1,161; 18.8; 447; 8; 2; 1; 7; 228. Hanover, 234,676; 1,303; 22.7; 672; 29; 3; 5; 12; 444. Magdeburg, 223,460; 1,570; 28.4; 909; (?); 42; 3; 20; 543. Dusseldorf, 198,787; 1,388; 28.6; 871; 4; 4; 4; 4; 555. Nuremberg, 181,047; 1,634; 37.6; 876; 109; 3; 1; 7; 510. Chemnitz, 176,900; 1,249; 28.8; 779; 4; 3; 2; 6; 68. Königsberg, 17,941; 1,347; 30.3; 642; (?); 9; 16; 8; 491. Charlottenburg, 172,166; 822; 20.3; 367; 11; 8; 3; 16; 217. Stettin, 159,132; 1,410; 36.4; 882; 14; 9; 13; 5; 661. Stuttgart, 153,165; 617; 30.9; 279; 4; 6; (?); 5; 164. Altona, 153,025; 810; 19.9; 422; 3; 3; 2; 4; 234. Elberfeld, 149,969; 785; 20.6; 338; 20; 60; 3; 11; 221. Bremen, 149,544; 714; 16.0; 337; 5; 1; 3; 7; 195. Strasburg, 145,307; 789; 22.0; 393; (?); 1; 1; 2; 327. Barmen, 134,768; 715; 21.5; 321; 11; 7; 7; 3; 262. Aix-la-Chapelle, 132,870; 929; 28.1; 533; (?); (?); 5; 8; 374. Dantzig, 129,378; 983; 30.6; 536; (?); 2; 9; 8; 404. Halle, 126,-736; 1,174; 37.8; 547; 8; 13; 5; 5; 418. Brunswick, 125,536; 784; 25.5; 409; 8; 2; 3; 5; 253. Essen, 109,012, 764; 28.9; 365; 26; 2; 1; 2; 298. Crefeld, 108,585; 573; 21.1; 297; 12; 6; 2; 8; 187. Mayence, 78,759; 428; 21.9; 184; 1; (?); 2; 1; 89. Metz, 59,065; 332; 22.4; 153; 1; (?); 6; 1; 113. Berne, 55,472; 235; 17.2; 64; (?); (?); (?); 4; 35. Bâle, 101,724; 374; 15.7; 133; (?); (?); 4; 6; 89. Geneva, 90,708; 333; 15.1; 70; (?); 2; 1, 2; 44. Lausanne, 44,266; 149; 14.3; 42; (?); (?); (?); 2; 26. Zurich, 161,726; 524; 13.1; 208; 2; 2; 4; 7; 118. Chaux-de-Fonds, 32,554; 105; 13.5; 36; (?); (?); (?); (?); 17. Vienna, 1,606,629; 7,616; 19.0; 2,719; 104; 58; 18; 58; 1,540. Buda Pesth, 666,722; 3,409; 20.1; 1,098; 19; 103; 29; 27; 602. Prague, 380,497; 1,674; 17.6; 468; 19; 31; 9; 24; 76. Trieste, 165,913; 1,049; 25.4; 315; (?); 31; 9; 13; 185. Lemberg, 140,687; 808; 23.9; 288; (?); 16; 14; 8; (?). Gratz, 123,819; 790; 25.5; 274; (?); (?); 2; 4; 1. Brünn, 103,659; 576; 22.2; 194; (?); 5; 4; 8; (?). Cracow, 83,730; 614; 29.3; 144; 4; 11; 1; 8; 83. Brussels, 561,130; 2,383; 17.0; 13; 17; 25; 9; 564. Anvers, 277,576; 1,328; 19.1; 13; 27; 15; 10; 397. Liège, 169,202; 635; 15.0; 9; 1; 7; 2; 113. Gand, 162,652; 964; 23.7; 2; (?); 11; 5; 386. Malines, 55,495; 370; 18.2; 1; 76; 5; 2; 55. Verviers, 52,445; 172; 12.7; 7; 1; 1; (?); 9. Bruges, 51,226; 244; 19.1; (?); (?); 2; 2; 14. Copenhagen, 345,000; 1,819; 19.2; 3; 17; 12; 34; 607.

Stockholm, 283,550; 1,813; 1,349; 25.6; 19.0; 11; 16; 5; 56; 227. Gothemburg, 123,500; (?); 467; (?); 15.1; 3; 4; 2; 1; 96. Christiania, 203,324; 1,803; 1,076; 34.2; 20.4; 1; 5; 4; 8; 388. St. Petersburg, 1,193,817; 7,108; 6,804; 21.3; 20.4; 153; 94; 282; 248; 1,461. Moscow, 1,023,817; (?); 8,026; (?); 32.1; 55; 67; 50; 86; 2,764. Warsaw, 601,508; 5,949; 4,365; 35.7; 26.2; 130; 114; 36; 45; 1,431. Odessa, 414,800; (?); 2,510; (?); 22.3; 38; 20; 44; 11; 750. Jassy, 70,065; 707; 534; 40.3; 30.4; (?); 4; 11; 1; 125.

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23. Lisbon, 344,189; 2,705; 1,939; 31.4; 22.5; 61; 1; 17; 8; 139. Algiers, 96,642; 467; 459; 19.3; 19.0; 3; (?); 8; (?); 64. Cairo, 534,677; 5,058; 5,586; 37.8; 41.8; 331; (?); 377; 44; 985. Alexandria, 273,653; 2,540; 2,714; 37.1; 39.6; 14; (?); 41; 4; 877. Damietta, 31,285; 318; 143; 40.6; 18.3; (?); (?); 3; (?); 14. Suez and Ismailia, 19,526; 240; 154; 25.2; 16.1; (?); (?); 2; (?); 38. Port Said, 30,773; 300; 167; 39.0; 21.7; (?); (?); 1; (?); 48.

BOOK REVIEWS.

AN ATLAS OF THE BACTERIA PATHOGENIC IN MAN, WITH DESCRIPTIONS OF THEIR MORPHOLOGY AND MODES OF MICROSCOPIC EXAMINATION. By SAMUEL G. SHATTUCK, F. R. C. S., Joint Lecturer on Pathology and Bacteriology, St. Thomas' Medical School, London; Pathological Curator of the Museum of the Royal College of Surgeons, London.—With an introductory chapter on BACTERIOLOGY: Its Practical Value to the General Practitioner, by W. WAYNE BABCOCK, M. D., Pathologist to the Kensington Hospital for Women; Clinical Pathologist to the Medical Chirurgical Hospital; Demonstrator of Pathology and Bacteriology in the Medico-Chirurgical College of Philadelphia. Sixteen full-page colored plates. Pp. 82. Price, $1.00. E. B. Treat & Co., 241-243 W. 23d Street, New York.

This admirably gotten up atlas is, in part, an abstract of the "International Medical Annual," 1898 and 1899, due, the publisher tells us, to many requests for the reproduction of those articles in separate form. Besides, there is here presented an introductory chapter on bacteriology, comprehending the gist of that important subject of every-day importance to all medical practitioners; and, to our knowledge, nowhere else so concisely expressed.

THE PHYSICIAN'S VISITING LIST FOR 1900. P. Blakiston's Son & Co., Philadelphia.

This visiting list is so well known, this being the forty-ninth year of its publication, that its announcement only seems to be all that is necessary at our hands. "A plain, systematic method of keeping physicians' accounts, well printed, strongly bound, durable, convenient and small." It is issued in five editions, severally for 25, 50 (in one and two volumes), 75 and 100 patients weekly,

and a monthly edition without dates. Plain leather binding, with flap and pencil. Price, $1.00; $1.25; $2.00; $2.25. Will be sent by mail, postage prepaid, to any address upon receipt of price, or may be ordered through any bookseller, news agent or wholesale druggist. Descriptive circular free upon application.

DISEASES OF THE RECTUM. CONSERVATISM, SURGERY, COMPARISONS. By W. C. Brinckerhoff, M. D. McVicker's Theatre Building, Chicago, Ill.

A brochure of thirty pages, comprehending reports of cases of disease successfully treated, of interest to all physicians.

CONTEMPORARY LITERATURE.

FOOD WHICH FAILS TO FEED.

THE NORTH AMERICAN REVIEW for November contains a highly valuable article, full of information of the most useful character, by Mr. Louis Windmüller, entitled "Food Which Fails to Feed." Mr. Windmüller deprecates the indifference to matters of diet essential to bodily health evinced by the average American and gives wise advice as to the manner in which errors of that description may be overcome. He dwells upon the criminal practice of adulterating food and drink, especially that consumed by the poor, and offers suggestions as to measures which might be taken by the Government to insure the purity and wholesomeness of the viands sold to the public. Mr. Windmüller observes:

"Our internal revenue law, which requires liquors to be stamped, should, when amended, provide that Government inspectors be required to test the liquor and stamp only that which they find to be pure, and that the impure should be destroyed under their supervision. Consumers would cheerfully pay a tax which would effectually protect them against adulteration. Respectable dealers and honest brewers would welcome a control which would endorse the purity of their beverages. In Germany and France the use of unwholesome ingredients in anything that is used there is prohibited."

THE HARMFUL EFFECTS OF FOODS may be due to any of the following causes:

1. Certain poisonous fungi may infect grains. This is the cause of epidemics of poisoning with ergotized bread, which formerly prevailed during certain seasons throughout the greater part of Continental Europe, but which are now practically limited to Southern Russia and Spain. In this country ergotism is practically unknown, except in the criminal use of the drug ergot. However, a few heads of cattle in Kansas and Nebraska have been quite extensively affected with the disease.

2. Plants and animals may feed upon substances that are not harmful to them, but which may seriously affect man on account of his greater susceptibility. It is a well-known fact that hogs may eat large quantities of arsenic or antimony without harm to themselves and thus render their flesh unfit for food for man. It is believed that birds that feed upon the mountain laurel furnish a food poisonous to man.

3. During periods of the physiological activity of certain glands in some of the lower animals the flesh becomes harmful to man. Some species of fish are poisonous during the spawning season.

4. Both animal and vegetable foods may become infected with the specific germs of disease and serve as the carriers of the infection to man. Instances of the distribution of typhoid fever by the milkman are illustrations of this.

5. Animals may be infected with specific diseases, which may be transmitted to man in the meat or milk. This is one of the means by which tuberculosis is spread.

6. Certain non-specific, poison-producing germs may find their way into food of various kinds, and may by their growth produce chemical poisons either before or after the food has been eaten. This is the most common form of food poisoning known in this country.—From "Food Poisons," by Prof. VICTOR C. VAUGHAN, "Appletons' Popular Science Monthly" for November.

THE PHILIPPINE PROBLEM.

Some people are still discusing the theoretic expediency of expansion. This has not been an open question since last winter. The act and fact of expansion was complete when the treaty of peace was ratified. You might indeed, as an academic matter, discuss the desirability of contraction. But towering over and overshadowing all merely speculative issues is the mighty (I had almost said the *awful*) fact of our actual sovereignty over and responsibility for the Philippine Islands. You can escape the consequences of some deeds by undoing them. But treaties cannot be

made and unmade at will, nor international obligations laid down because they are burdensome. It does not matter what were your views on the previous question of annexation. The only question to-day open to you is this: The United States having taken the Philippine Islands from Spain, what shall be done with them?—From "The Problem of Territorial Expansion," by President Jacob Gould Schurman, in the "American Monthly Review of Reviews" for November.

The chief editorial topic in the "American Monthly Review of Reviews" for Nember is the war in South Africa. In "The Progress of the World" the editor gives a full exposition of the British and Boer sides of the quarrel, respectively. The subject is also treated in the department of "Current History in Caricature," and Mr. Stead contributes a character sketch of "the man of the month" in South Africa—Cecil Rhodes.

STUART'S "WASHINGTONS."

In the course of a page in the November "Century" on the paintings of Gilbert Stuart Charles Henry Hart says that the artist used to call his replicas of the Athenæum head his hundred-dollar pieces. He painted three portraits of Washington from life, and these present two totally dissimilar types. At what prescise date the first picture was painted, showing the right side of the face, we do not know, but it was doubtless early in 1795. In April, 1796, he painted his second portrait of Washington from life, the whole-length known as the Lansdowne type, the pose and composition of the picture being taken almost bodily from Rigaud's portrait of Bossuet. This portrait shows the left side of the face, as does the very similar vignette head, left unfinished by the painter, and which, called the Athenæum head, is the household Washington.

THE CENTURY MAGAZINE for November is probably the handsomest number of that or indeed of any other magazine ever issued. The cover design includes a portrait of Cromwell redrawn on stone by Ernest Haskell and printed in four tints, while the frontispiece—also in tints—is a wood engraving by T. Johnson from Cooper's painting of the Protector in Sidney Sussex College, Cambridge. The experiment in color printing is not confined to these two portraits, nor to the illustrations in the opening instalment of John Morley's study of Cromwell. It extends also to the striking full-page and half-page drawings and marginal sketches with which Seton Thompson supplements the work of his pen in narrating the first part of "The Biography of a Grizzly."

ST. NICHOLAS for November, beginning a new volume, is a number of unusually varied interest, not the least striking of its contents being the announcement of the St. Nicholas League, with its motto, "Live to Learn and Learn to Live," its conditions of membership and the prizes it offers in competition. The frontispiece by Jay Hambidge illustrates a true story by Ian Maclaren of the rescue of a horse by one of his father's farm hands, at the expense of the gallant rescuer's own life. "A Little Girl's Glimpse of Tennyson," by Mrs. Edith M. Nicholl—the "little girl of the story," now a middle-aged-woman, living at the antipodes—is illustrated by Harry Fenn. "Our Miniature Navy," consisting of models of the twenty-three best ships of the American Navy, is accurately described by Whitman Osgood and George P. Conn. Short stories, verses and pictures abound in this as in all other numbers of "St. Nicholas."

THE QUESTION OF OLD-AGE PENSIONS.

This vital subject is discussed "from a Socialist's Standpoint" in the November "New Lippincott," by the Hon. John C. Chase, mayor of Haverhill, Mass. His faith in a future solution of the problem is quoted below:

"Once the question of old-age pensions is taken up and discussed and they are found necessary, the way will be opened for their adoption.

"I have written this from a standpoint which makes me believe that it is necessary only under existing conditions. I believe also that some day there will be a state of society under which no special aid will be required to provide for the average man or woman in old age."

THE LIVING AGE, which recently reprinted from the "Nineteenth Century" a caustic criticism of the Women's Congress, written by a woman, presents the other side in its issue for Nov. 4, in an article written for the "Nineteenth Century" by Fannie H. Gaffney, president of the American Woman's Council.

American readers will have an opportunity to become familiar with the most striking work which M. Rene Bazin, one of the most gifted of the younger French writers, has thus far done in the translation of "The Perishing Land," which is to be published serially in "The Living Age," begun in the number for Nov. 4. This story attracted wide attention on its publication in France, early this year. It is full of incident and of local color and shows rare skill in the delineation of character.

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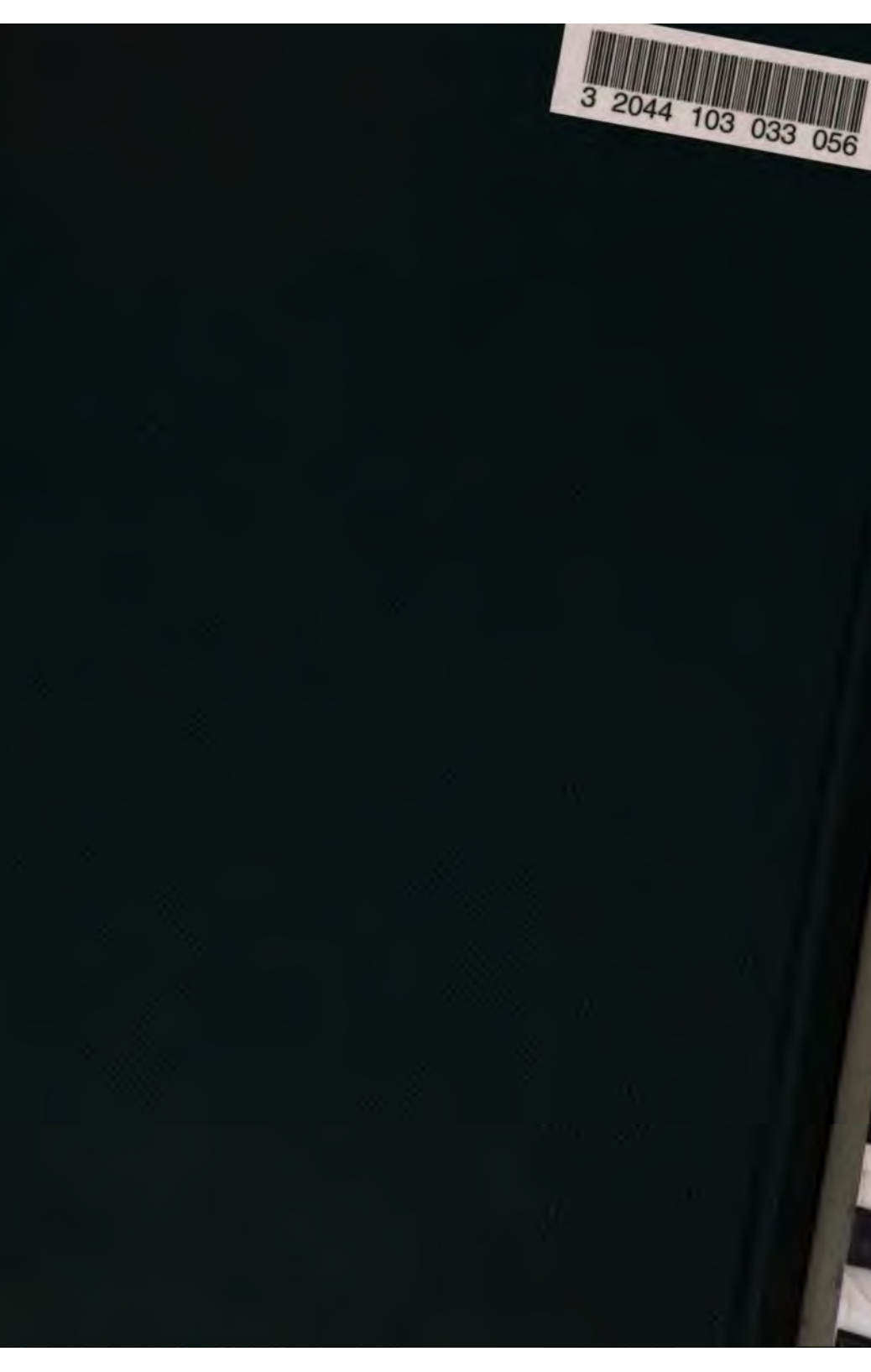
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